DEPARTMENT OF THE ARMY APPROPRIATIONS FOR 1953

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS HOUSE OF REPRESENTATIVES

EIGHTY-SECOND CONGRESS

SECOND SESSION

SUBCOMMITTEE ON DEPARTMENT OF THE ARMY APPROPRIATIONS

ROBERT L. F. SIKES, Florida, *Chairman*

DANIEL J. FLOOD, Pennsylvania ERRETT P. SCRIVNER, Kansas

CORHAL D. ORESCAN, *Executive Secretary to Subcommittee*

PART 2

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DEPARTMENT OF THE ARMY APPROPIATIONS FOR 1953

Thursday, February 28, 1952

RESEARCH AND DEVELOPMENT, ARMY

WITNESSES

MAJ. GEN. W. H. MARIS, CHIEF, RESEARCH AND DEVELOPMENT DIVISION, G–4

BRIG. GEN. S. R. MICKELSEN, CHIEF, SPECIAL WEAPONS BRANCH, RESEARCH AND DEVELOPMENT DIVISION, G–4

COL J. H. DUDLEY, MANAGEMENT SECTION, PLANNING BRANCH, RESEARCH AND DEVELOPMENT DIVISION, G–4

MAJ. GEN. G. H. DECKER, CHIEF, BUDGET DIVISION, OFFICE OF COMPTROLLER OF THE ARMY

BRIG. GEN. L. E. SIMON, CHIEF, RESEARCH AND DEVELOPMENT DIVISION, OFFICE, CHIEF OF ORDNANCE

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M. S. PEAKE, PLANS AND EVALUATION BRANCH, RESEARCH AND DEVELOPMENT DIVISION, OFFICE, CHIEF OF CHEMICAL CORPS

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MAJ. GEN. E. T. BULLENE, CHIEF, CHEMICAL CORPS

LT. COL. D. G. HAMMOND, ENGINEER, RESEARCH AND DEVELOPMENT DIVISION

W. J. NEW, RESEARCH AND DEVELOPMENT DIVISION, OFFICE, CHIEF OF ENGINEERS

COL. T. J. KNOBLAUCH, MEDICAL RESEARCH AND DEVELOPMENT BOARD

COL. J. R. WOOD, MEDICAL RESEARCH AND DEVELOPMENT BOARD

COL. T. R. J. HICKEY, RESEARCH AND DEVELOPMENT DIVISION, OFFICE OF THE QUARTERMASTER GENERAL

C. J. BLAKE, DISPENSING AND HANDLING EQUIPMENT BRANCH, RESEARCH AND DEVELOPMENT DIVISION, OFFICE, QUARTERMASTER GENERAL

J. MILLARD, MECHANICAL PRODUCTION BRANCH, RESEARCH AND DEVELOPMENT DIVISION, OFFICE, QUARTERMASTER GENERAL

COL. L. S. GRIFFING, RESEARCH BRANCH, RESEARCH AND DEVELOPMENT DIVISION, G–4

DR. M. P. CRAWFORD, HUMAN RESOURCES RESEARCH OFFICE

DR. E. A. RUNDQUIST, PERSONNEL RESEARCH SECTION, PERSONNEL AND PROCEDURES BRANCH, ADJUTANT GENERAL'S OFFICE

COL. A. W. LYON, TRANSPORTATION CORPS

COL. J. T. HERROD, RESEARCH AND DEVELOPMENT SECTION, HEADQUARTERS, ARMY FIELD FORCES

CAPT. J. OVERHOLT, ARMY SECURITY AGENCY

COL. D. E. ANTES, LOGISTICS DIVISION, ARMED FORCES SPECIAL WEAPONS PROJECT

COL. C. A. CLARK, JR., COMPTROLLER, ARMED FORCES SECURITY AGENCY

95192—52——41

Amounts available for obligation

	1951 actual	1952 estimate	1953 estimate
Appropriation or estimate			$459,000,000
Transferred (pursuant to 63 Stat. 585) from—			
"Emergency fund, Department of Defense"		$1,512,000	
"Contingencies of the Army"		7,925,000	
"Finance service, Army," travel of the Army		96,790	
"Quartermaster service, Army," incidental expenses of the Army		15,184,000	
"Transportation service, Army"		6,256,600	
"Signal service of the Army"		61,755,000	
"Medical and hospital department, Army"		10,069,000	
"Engineer service, Army"		17,019,000	
"Ordnance service and supplies, Army"		242,194,550	
"Chemical service, Army"		29,260,899	
"Army training"		1,822,732	
Adjusted appropriation or estimate		393,095,571	450,000,000
Balance transferred (pursuant to 63 Stat. 585) from—			
"Quartermaster service, Army, incidental expenses of the Army"		1,523,808	
"Signal service of the Army"		1,813,376	
"Ordnance service and supplies, Army"		28,464,629	
"Chemical service, Army"		2,346,565	
Reimbursements from other accounts		322,480	416,480
Obligations incurred		427,566,429	450,416,480
Comparative transfer from—			
"Contingencies of the Army"	$4,990,810		
"Finance service, travel of the Army"	146,491		
"Quartermaster service, Army, incidental expenses of the Army"	11,902,438		
"Transportation service, Army"	4,452,742		
"Signal service of the Army"	56,849,474		
"Medical and hospital department, Army"	7,140,863		
"Engineer service, Army"	16,187,364		
"Ordnance service and supplies, Army"	157,309,173		
"Chemical service, Army"	25,771,782		
"Army training"	1,423,415		
"Service-wide operations, Navy"	2,539,700		
Total obligations	288,624,252	427,566,429	450,416,480

Obligations by activities

Description	1951 actual	1952 estimate	1953 estimate
Direct Obligations			
1. Land combat matériel and techniques	$104,100,977	$160,855,326	$165,184,909
2. Air defense matériel and techniques	35,287,883	73,919,502	66,806,622
3. Airborne landing, amphibious, and supply and maintenance matériel and techniques	23,506,340	20,624,628	23,717,918
4. Atomic, biological, and chemical warfare matériel	35,316,030	44,271,241	49,746,407
5. Personnel, intelligence, and planning operations	34,968,651	41,371,565	47,792,853
6. Supporting research and other operations	55,626,428	84,302,965	94,312,070
7. Boards, testing and advisory	1,542,316	1,898,722	2,439,221
Total direct obligations	288,348,625	427,243,949	450,000,000
Obligations Payable Out of Reimbursements From Other Accounts			
1. Land combat matériel and techniques	59,875	60,000	60,000
4. Atomic, biological, and chemical warfare matériel	27,119	25,000	29,000
5. Personnel, intelligence, and planning operations	185,883	237,480	327,480
6. Supporting research and other operations	2,750		
Total obligations payable out of reimbursements from other accounts	275,627	322,480	416,480
Total obligations	288,624,252	427,566,429	450,416,480

Obligations by objects

Object classification	1951 actual	1952 estimate	1953 estimate
Summary of Personal Services			
Total number of permanent positions	17,664	19,077	20,616
Full-time equivalent of all other positions	29	66	81
Average number of all employees	15,335	17,730	19,230
Deduct average number paid from project order funds	1,728	528	580
Average number of employees paid from 01 Personal services	13,607	17,202	18,650
Average salaries and grades:			
General schedule grades:			
Average salary	$4,104	$4,650	$4,640
Average grade	GS–6.7	GS–6.8	GS–6.8
Crafts, protective, and custodial grades:			
Average salary	$2,618	$2,971	$2,957
Average grade	CPC–4.2	CPC–4.2	CPC–4.2
Ungraded positions: Average salary	$3,278	$3,371	$3,371
Personal service obligations:			
Permanent positions	$58,568,529	$74,355,069	$82,852,377
Part-time and temporary positions	192,940	404,147	457,179
Regular pay in excess of 52-week base		278,390	319,502
Payment above basic rates	2,843,630	3,302,139	2,878,369
Total personal service obligations	61,605,099	78,339,745	86,507,427
Deduct amount financed from project orders charged to object classes 07, 08, and 09	6,608,670	1,992,244	2,200,692
Net personal service obligations	54,996,429	76,347,501	84,306,735
Direct obligations			
01 Personal services	54,851,660	76,175,121	84,130,855
02 Travel	2,318,778	3,632,033	4,527,162
03 Transportation of things	1,026,086	1,854,968	2,329,621
05 Rents and utilities	238,131	280,995	306,511
06 Printing and reproduction	110,252	41,150	41,152
07 Other contractual services	154,860,448	226,865,305	228,600,486
08 Supplies and materials	39,026,240	71,222,064	72,994,579
09 Equipment	35,913,154	46,880,814	56,699,759
13 Refunds, awards, and indemnities	264	700	700
15 Taxes and assessments	70,088	365,799	444,175
Subtotal	288,415,101	427,318,949	450,075,000
Deduct charges for quarters and subsistence	66,476	75,000	75,000
Total direct obligations	288,348,625	427,243,949	450,000,000
Obligations payable out of reimbursements from other accounts			
01 Personal services	144,769	172,380	175,880
02 Travel	4,716	6,400	6,700
07 Other contractual services	19,072	36,666	68,166
08 Supplies and materials	82,270	80,123	115,424
09 Equipment	24,668	26,668	50,066
15 Taxes and assessments	132	243	244
Total obligations payable out of reimbursements from other accounts	275,627	322,480	416,480
Total obligations	288,624,252	427,566,429	450,416,480

Analysis of expenditures

	1951 actual	1952 estimate	1953 estimate
Unliquidated obligations, start of year			$317,243,949
Obligations incurred during the year		$427,566,429	450,416,480
		427,566,429	767,660,429
Deduct:			
Reimbursable obligations		322,480	416,480
Unliquidated obligations, end of year		317,243,949	467,243,949
Total expenditures		110,000,000	300,000,000
Expenditures are distributed as follows:			
Out of current authorizations		110,000,000	110,000,000
Out of prior authorizations			190,000,000

Summary of direct obligations by activity

Activity No.	Title	Actual fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1100	Land combat matériel and techniques	$104,100,977	$160,855,326	$165,184,909
1200	Air defense matériel and techniques	35,287,883	73,919,502	66,806,622
1300	Airborne landing, amphibious, supply and maintenance, matériel, and techniques	23,506,340	20,624,628	23,717,918
1400	Atomic, biological and chemical warfare matériel	35,316,030	44,271,241	40,746,407
1500	Personnel, intelligence and planning operations	34,968,651	41,371,565	47,792,853
1600	Supporting research and other operations	53,626,428	84,302,965	94,312,070
1700	Boards, testing and advisory	1,542,316	1,898,722	2,439,221
	Total direct obligations	288,348,625	427,243,949	450,000,000

1100 Land Combat Matériel and Techniques

Direct obligations by project

Number	Project	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1110	Combat and tactical vehicles, including tanks and self-propelled artillery	$26,103,189	$38,419,490	$33,959,560
1120	Guns, ammunition, rocket launchers, and their ammunition	25,544,898	46,005,700	44,370,020
1130	Guided missiles, surface-to-surface launching devices, control and guidance systems	22,460,951	51,345,527	50,831,921
1140	Fire control, electronic communications, etc., for land combat operations	16,620,826	14,342,599	16,267,735
1150	Supporting equipment for land combat operations, flame throwers, incendiaries, land mines, etc	13,371,113	10,742,010	19,755,673
	Total direct obligations	104,100,977	160,855,326	165,184,909

1200 Air Defense Matériel and Techniques

Direct obligations by project

Project No.	Project title	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1210	Antiaircraft weapons (except guided missiles) and ammunition, including fuzes	$10,421,865	$26,075,044	$26,889,080
1220	Guided missiles, surface-to-air and associated equipment	14,188,286	32,873,965	28,532,918
1230	Fire control, electronic counter measures, etc., required for air defense operations	10,677,732	14,970,493	11,383,724
	Total direct obligations	35,287,883	73,919,502	66,806,622

1300. Airborne Landing, Amphibious, Supply and Maintenance Matériel and Techniques

Direct obligations by project

No.	Project	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1310	Airborne landing amphibious operations	$8,603,702	$4,981,689	$7,176,766
1320	Supply and maintenance operations	14,902,638	15,642,939	16,541,152
	Total direct obligations	23,506,340	20,624.628	23,717,918

1400 Atomic, Biological and Chemical Warfare Matériel

Direct obligations by projects

No.	Project	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1410	Atomic Warfare	(1)	(1)	(1)
1420	Biological Warfare	(2)	(2)	(2)
1430	Chemical Warfare	(3)	(3)	(3)
	Total direct obligations	$35,316,030	$44,271,241	$49,746,407

[1] See Classified section, p. 5–6.
[2] See Classified section, p. 7.
[3] See Classified section, p. 8.

1500 Personnel, Intelligence and Planning Operations

Direct obligations by project

No.	Project	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1510	Personnel operations	$11,717,876	$16,529,892	$18,975,855
1520	Intelligence and planning operations	23,250,775	24,841,673	28,816,998
	Total direct obligations	34,968,651	41,371,565	47,792,853

1600 Supporting Research and Other Operations

Direct obligations by projects

No.	Project title	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1610	Supporting research in ordnance	$26,540,921	$38,089,287	$38,173,940
1620	Supporting research in guided missiles	9,036,939	15,268,165	18,735,274
1630	Supporting research in other technical fields	16,237,754	24,746,852	27,340,088
1640	Other operational categories	1,810,814	6,198,661	10,062,768
	Total direct obligations	53,626,428	84,302,965	94,312,070

1700 Army Field Forces Boards

Direct obligations by project

No.	Project	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1710	Army field forces boards	$1,542,316	$1,898,722	$2,439,221
	Total direct obligations	1,542,316	1,898,722	2,439,221

General DECKER. Mr. Chairman and members of the committee, we are ready to proceed with the appropriation for research and development. The principal witness will be Maj. Gen. Ward H. Maris, the head of the Research and Development Division of the general staff.

Mr. SIKES. General Maris, the committee will be very glad to hear from you on the requirements of the Research and Development Division for fiscal 1953.

GENERAL STATEMENT OF THE CHIEF, RESEARCH AND DEVELOPMENT DIVISION, G–4

General MARIS. Mr. Chairman and members of the committee, the broad mission of the Army's fiscal year 1953 research and development program can be summed up quite simply.

GOAL OF THE RESEARCH AND DEVELOPMENT PROGRAM

As you well know, the two basic elements comprising our war potential are manpower and the means required for combat. The more critical of these is our limited supply of manpower. It is obvious that to compensate for our manpower deficiency, we must provide weapons, techniques, and equipment of such superiority that with proper training and leadership our forces can reach a state of combat effectiveness superior to that of any potential enemy.

The Army's research and development program is designed to meet this challenge. To insure that we will have all the essential types of weapons and equipment required by the Army; that these items incorporate where needed the latest and best technological features attainable within the limits of our economy and natural resources; and that our technological skills are constantly utilized to simplify this equipment, improve ease of maintenance and decrease its cost.

We have made encouraging progress in this direction since the outbreak of hostilities in Korea. The performance of American soldiers against the numerically superior enemy in that conflict has in itself reflected, in some measure, the impact of improved weapons, equipment, and techniques over horde tactics.

ACCELERATION OF RESEARCH AND DEVELOPMENT PROGRAM

Under the threat of an enemy more powerful than those in Korea, the research and development program was accelerted in fiscal year 1951. The program has gathered further momentum in the first half of fiscal year 1952. Another year of this level of effort we believe will produce a substantial pay-off.

I think it is obvious to all of us that no single weapon can meet all requirements. Just as our Nation needs a balanced, defensive force comprising ground, sea and air forces, each of these in turn needs an appropriate balanced system of weapons designed to meet the requirements which are the responsibilities of each of these elements.

BALANCE IN THE RESEARCH AND DEVELOPMENT PROGRAM

Our research and development effort, therefore, is based on the concept of balance which means that we strive to place in the hands of our troops, not just one single fantastic weapon which our wishful

thinkers hope will be a panacea, but, rather, all of the weapons and equipment needed by combat arms and the equipment needed by the technical services for their support; in other words, everything that is essential to victory.

PRELIMINARY EVENTS

Before proceeding with discussion of the fiscal year 1953 budget, I would like to dwell for just a few moments on a little past history. When World War II ended, there existed a vast supply of the then current weapons and equipment. We knew that this material was of proven effectiveness, but we also knew that improvements and revolutionary developments could be accomplished—indeed, would have to be accomplished. On the recommendation of our scientific advisors, and with full knowledge of the long lead-time factors in research and development, the limited funds available to the Army during the succeeding years for research and development were devoted to a plan which included:

First, basic research over a period of years in areas such as electronics, metallurgy, chemistry, bacteriology, explosives, and so forth.

Second, correction of known deficiencies in existing equipment and improvement of its design.

Third, development of components for new families of weapons and equipment.

And finally, the development of new and expensive items of warfare, the majority of which were necessarily on a long-term basis because of their complexity and high cost.

ACCOMPLISHMENTS OF RESEARCH AND DEVELOPMENT

Considering some of our recent accomplishments I believe this chart will give you an idea of the number of items completed during the first half of fiscal year 1952 with research and development funds previously granted by the Congress. The characteristics of many of the individual items included in the totals shown on the chart are, of course, classified, and with the committee's permission I would like to reserve consideration of those classified details for later discussion by the individuals in charge of the various technical services.

Mr. SIKES. Very well.

HIGH COST OF DEVELOPMENTAL ITEMS

General MARIS. Many of the items which we will discuss and of which we will have models, pictures, or, in some cases, the item itself to show you, are costly. We are directing every effort toward reducing these high costs wherever feasible through elimination of nonessential parts or substitution of cheaper components. I wish to assure the gentlemen of this committee that economy is a watchword of our research and development program, and this is true, not only in respect to the costlier areas, such as guided missiles and tanks, but in the smaller individually less expensive items as well. We will have a number of examples of specific economies to demonstrate to the committee during later testimony.

EFFORTS TO ACHIEVE ECONOMY

However, as an illustration, I would like to invite to your attention just one unclassified small item which shows what was done to attain economy on a mundane piece of equipment. We have here a new type one-burner gasoline stove completed last year by the Quartermaster Corps. Careful, skillful design increased its heating efficiency by 50 percent and reduced its cost compared to its predecessor, to an extent that procurement savings during the past year on this one item amounted to $615,000 and 65 tons of scarce nickel-bearing stainless steel.

Mr. FLOOD. What about weight?

General MARIS. There is not so much difference in weight in these.

Mr. SIKES. What is the individual cost of each?

General MARIS. As to the exact cost, I do not have that information. The Quartermaster can give you further information on it. I just picked this out as an example of total over-all savings.

Mr. FLOOD. Did you do this or did somebody else do it?

General MARIS. Our Quartermaster Corps did it.

Mr. FLOOD. I know, but what about the Research and Development Division. You are asking for the money. Is this an example of what you did for your money or what somebody else did?

General MARIS. This was done by our Quartermaster Research and Development people.

Mr. FLOOD. Under your shop?

General MARIS. Yes, sir.

Mr. FLOOD. All right.

General MARIS. Our efforts in the direction of economy are not by any means confined to savings of the more obvious type I have just illustrated. An indirect, but no less effective, approach is pursued through continuing evaluation of each of the more than 2,000-odd projects in which we are engaged, with a view to dropping those which show lack of promise or feasibility, those for which the original requirement has been canceled, or where a satisfactory commercial substitute has been located for the anticipated end item. A total of 193 projects have been thus eliminated during the past half year. The funds originally allocated for each such project have been promptly diverted to others having high priority and promise of benefits and to new projects.

SPECIFIC OBJECTIVES UNDER 1953 BUDGET

Turning now to our fiscal year 1953 budget, the major specific objectives envisioned for use of the funds requested in fiscal year 1953 are:

(*a*) Improvement of the effectiveness of our tank weapons.

(*b*) Improvement of our miiltary mobility, especially on the battlefield.

(*c*) Improvement in communications.

(*d*) Improvment of the effectiveness of antitank weapons, particularly in the fields of recoilless weapons, rockets and mines.

(*e*) Further developing our capability for destroying enemy aircraft with guided missiles.

(*f*) Increasing the reliability, capacity, and range of antiaircraft warning systems and asssociated systems.

(*g*) Futher developing the means to utilize atomic warheads for tactical purposes:

(*h*) Developing new and special weapons.

(*i*) Generally increasing the effectiveness of ground troops.

We feel that our fiscal year 1953 research and development program is a well integrated plan designed to accomplish these objectives with the most effective and economical utilization of manpower, money, time, and material. The program was designed to meet specific objectives established by the Army under the strategic guidance of the Joint Chiefs of Staff, scientific and technical guidance from the Research and Development Board, statements of requirements from the using arms and services, as set forth in the Army Equipment Development Guide, and new requirements arising from operations in Korea. We have specifically removed from preliminary estimates projects which would secure only minor improvements but could not be ready to meet the timing indicated by strategic guidance. We have also channeled all projects to meet the specific Army requirements.

STRUCTURE OF THE RESEARCH AND DEVELOPMENT BUDGET

You will note that the budget you have before you totals $450 million for 1953, $427 million for 1952, and $288 million for 1951. Included in these amounts are the funds for two Department of Defense agencies of a highly classified nature. Representatives of each of these activities will be here today and are prepared to discuss their portions of this budget which, for fiscal year 1953, total approximately $18 million. These two agencies had comparable amounts in the fiscal year 1951 and fiscal year 1952 appropriations. The Army handles their budgets as a matter of fiscal expediency, but does not determine how they utilize the money. I wish to make it clear to the committee, therefore, that the amount I am justifying for strictly Department of the Army research and development responsibilities is $432 million, and not the $450 million which represents the total budget for this appropriation.

This chart shows in rounded figures a comparison of the Army's appropriation of the 1953 budget, or $432 million, with the two previous years, distributed to the seven activities in the research and development program. These provide a functional breakdown of the budget rather than the field operational breakdown by developing agency which we propose to follow in this presentation.

You note these activities are numbered 1100, 1200, 1300, 1400, 1500, and so forth, in accordance with the new approved performance type budget.

In 1951, when our program was just beginning to gather momentum demanded by the world situation, the budget totaled $270 million. The comparable figure for 1952 was $405 million. This increase permitted our program to move into high gear, where we must keep it until we get the full benefit of the acceleration we have been successful in achieving to date. In the light of increased costs, the program which can be supported in fiscal year 1953 with this budget, $432 million, permits a level of activity approximately that of 1952.

This next chart shows the breakdown of the Army's portion of the budget by developing agencies, that is, the Technical Services, such as the Ordnance, the Engineers, the Signal, the Chemical, the Medical, the Quartermaster, Transportation, and so on.

Before going into this subject in detail, however, I want to point out again that research and development is basically aimed at producing the greatest possible military effectiveness for the amount of effort the Nation puts into military affairs. This aim requires systems and equipment that require the fewest number of men on the battlefield, facilitate maintenance and training, are economical in terms of demand placed on factories and on transport, and conserve scarce materials. We have a full appreciation of the fact that a satisfactory over-all solution to these contradictory requirements is necessary if we are to remain a strong Nation, in the economic as well as the military sense.

Gentlemen, this concludes my prepared general statement. With the committee's permission, I now propose to have representatives of each of the developing agencies present their respective programs as an integrated whole, following within each the prescribed budget pattern as set forth in the budget book before you. I believe that this procedure will convey a clear picture of what we have accomplished and hope to accomplish.

Mr. SIKES. In other words, you want to present a complete picture before we go into questioning?

General MARIS. We are perfectly happy to have you ask questions at any time.

Mr. SIKES. I think we would like to get the whole story before us first. Go ahead.

General MARIS. I would like to present, first, General Simon of the Ordnance Corps, who will give us the Ordnance budget.

ORDNANCE RESEARCH AND DEVELOPMENT

Mr. SIKES. Go ahead, General Simon.

OBJECTIVES OF ORDNANCE RESEARCH AND DEVELOPMENT PROGRAM

General SIMON. Mr. Chairman and gentlemen, before proceeding with the details of the Army Ordnance research and development budgetary requirements for the coming fiscal year, I should like to take this opportunity to speak, very generally, regarding our over-all objectives. The Ordnance Corps adopted fourfold design objective as follows: Effectiveness, ruggedness, simplicity, and economy. Economy is placed last, not because least but for the sake of emphasis.

Research and development has a tremendous power in effecting economies because a small economy in the cost of a unit item can effect millions of dollars' worth of economy in the repetitive items. In that connection, may I point out to you one accomplishment which the committee, except Mr. Flood, is familiar with from last year. This will have to be off the record.

(Discussion off the record.)

ECONOMY ATTEMPTS IN ORDNANCE RESEARCH AND DEVELOPMENT

General SIMON. We think, however, that there are other means of economy. We strive for economy in our research and development leading to economy in the production of the items. Secondly, we strive for economy in research and development, particularly in the use of critically short scientific and engineering personnel.

Thirdly, we look for economy in our whole research and development procedure, from the manufacturing process right on through to the firing line, which means economy in the use of logistics; economy in the number of spare parts; economy in interchangeability in order to reduce the number of people required for supply and maintenance. So, we are attacking economy on four fronts.

In pursuit of our design obejctives, we endeavor, through constant recourse to the conference method, to bring to bear upon our work the benefit of the ideas of our customers, the using arms, engineers, scientists, and production people, in order to maintain, as nearly as possible, an undeviating approach toward our goal—superior weapons for our Armed Forces.

ORDNANCE RESEARCH AND DEVELOPMENT METHODS

I would like to ad lib just a little bit, particularly for the benefit of Mr. Flood, who was not here last year, when I presented what I called National Defense at Less Cost Through Research, with apologies to the du Pont Co. In that, I outlined how we go about our work and how we have our research people constantly carrying on research. If you do not do research in supporting your development, you will never get the new things ready on time. Then, when the using arms come forth with a new requirement, we get the scientists around the table, just as we are now, with members of the using arms, and members of our developing agencies, and discuss the matter and find out if it is practical to do so. Research brings in its basic ideas so that anybody who has a good idea get consideration. Certain studies have to be conducted. It perhaps takes from 1 week to 6 weeks. Then we bring those in and frame theme in clear and succinct terms, and put the development in the hands of the engineers. We do not have scientists in the design and development field. Our method of doing that is to put a contract with the firm that has an available competent engineering staff and lay the job down on the board with them, with enough of our contract people to supervise the contract properly, but not boss them to the extent of not letting the development agency have a free hand in meeting the legal requirements of the contract. Then it goes to our proving grounds for development. When it passes the engineering test, it goes to the customer again who laid the requirements down to see if it fits in with the troops. That is known as the service test. When it passes that test, it goes into production.

I am sure that you recognize the need to maintain continuously a vigorous and intelligent program of research and development. In the paragraphs which follow, I shall attempt to indicate some of the progress which we have attained in the past and point out a few of the many projected tasks which we have planned for the future.

For the continuation of this program the Ordnance Corps is asking for $277.8 million for 1953 as compared with $270.8 million for 1952 and $157.2 million for 1951.

ORDNANCE LAND-COMBAT MATÉRIEL AND TECHNIQUES

I would like to point out now the categories in which we propose to spend this money. These are the budget activities as are outlined in the budget. Obviously the very large budget activity is land combat.

Land combat composes such a large proportion of Ordnance work. I will take these up one by one, and we may have to reintroduce the chart. However, before going on with our respective budget categories, I would like to point out what becomes of the Ordnance money. I will go ahead with this part here, which deals with budget activity 1100, "Land combat."

This covers projects on pages 6 to 18, inclusive, in the justifications. That is projects 1110, 1120, 1130, 1140, and 1150. "Land combat" includes, among other items, combat and tactical vehicles; guns, ammunition and rocket launchers; surface-to-surface guided missiles; fire-control equipment for land combat; Army aircraft and land mines and fuzes.

With respect to the magnitude of the "Land combat" category, I would like to point out that this large amount of money, $95,000,000, covers among other things, tanks. In the Army procurement program, which is actively being prosecuted today, $1 in every $3 is going for combat vehicles, which is just one item in our category 1100, "Land combat matériel." So, any economies we can effect through wise research and development will be reflected many, many times in this important field of land combat.

TANK DEVELOPMENT

You will recall that after the close of World War II the limited funds available for research and development in this field were devoted to the development of a new family of air-cooled engines, cross-drive transmissions, guns, fire-control equipment, and other components both in the combat and general-purpose vehicle fields. A family of light-, medium-, and heavy-gun tanks utilizing these various components had been adopted for development, with plans to place the light- and medium-gun tanks in production if the situation required and if the tests of the prototypes were successful. Meanwhile, World War II Pershing tanks were converted to the M–46 Pattons by substitution of the new 800-horsepower engine and matching transmission.

We did not have enough money in those days to build complete tanks. We tried to build up our component family, and an 800-horsepower engine was designed for the heavy-gun tank, which is being developed now. By putting it in the M–46 Pershing tank, called the Patton, we had a wonderful way to test thoroughly that high-powered transmission. Now it turns out we are squeezed to where we are using it constantly, because we got caught in the change there. In fact, the troops like it so well I do not know if we will ever get that engine away from them or not.

This tank gave a very good acount of itself in Korea, although, because of the need for tanks, it was shipped to Korea without correction of defects already disclosed by troop tests then under way. It can defeat comparable tanks of other nations.

(Off the record.)

Mr. SIKES. General, those figures are so far different from the run-of-the-mill statements that you see and hear in the press and over the radio about the performance of American tanks that, while I hope they are true, still I would like for you to tell us some more

about what they are based on. We have been told time after time after time that our tanks actually are not matching the Russian tanks.

(Off the record.)

General SIMON. I believe they were under your observation and reported to you.

General MARIS. Yes, sir. We sent Operations Research teams to Korea under the Operations Research program of Johns Hopkins University, consisting of a group of scientists under Dr. Ellis Johnson. We asked him to go to Korea with his team and actually investigate throughout the entire battle area just exactly what was the cause of the defeat of American tanks and Russian tanks. They covered the entire battle area and presented the facts in their reports as they accounted for them. They organized teams, including military personnel as well as the scientific personnel, in order to determine as near as they could what had caused the defeat of each of these individual tanks on the battlefield. Also, they interrogated all of the personnel in connection with these things. They checked every source and every bit of information and then submitted that in the form of a report to the Department of the Army to indicate or give us the actual facts as they found them.

(Discussion off the record.)

Mr. SIKES. That is very heartening information. I wonder if we could have him appear before this committee to tell us what he did see out there.

General SIMON. You could have his report, could they not, General Maris?

Mr. SIKES. We would like to hear him. Can you arrange that?

General MARIS. Yes, sir.

General SIMON. This is out of my control in the sense that General Maris is checking on me. It is not under my control. It is an independent survey largely made by civilians.

Mr. SCRIVNER. It is paid for by military funds?

General MARIS. Yes, sir.

General SIMON. But I do not have control, Mr. Scrivner. I am not my own inspector.

General MARIS. It is a critical examination. In other words, we are getting an independent group to criticize and find out what is wrong, wherever we possibly can, and make the corrections.

Mr. SCRIVNER. I would suggest we make arrangements to have him come up here.

Mr. SIKES. Yes. I would like to have you arrange to have him appear here.

Mr. SCRIVNER. As a matter of fact, his reports are among those which it is suggested we get.

(Discussion off the record.)

Mr. SIKES. All right. You will arrange for Dr. Johnson to appear before this committee?

General MARIS. Yes.

Mr. SIKES. Go ahead.

General SIMON. In December 1950 the decision was made, as General Collins told you some while back, to go into production on the entire family of tanks and associated vehicles without the benefit of our

normal test procedure and without the benefit of our normal correction procedure.

Mr. SCRIVNER. Where did you read that?

General SIMON. General Collins announced it in the paper and I believe he made a statement before the Congress that we are going into production on the full family of tanks.

Mr. SCRIVNER. The medium tank?

General SIMON. The medium tank, which is the M–47, and a limited production on the heavy tank, the T–43. It was published also in United States News and World Reports.

General MARIS. He came up on the Hill to speak to a committee.

Mr. SCRIVNER. If my memory is correct, that does not coincide with what we understood. We will go into that later.

General SIMON. This is the light tank, the Walker Bulldog, on which we went into production, and this is the M–47, which is the successor to our M–46, and this is the heavy gun tank which is about to get to the proving grounds, being designed by the Chrysler Corp.

Mr. SIKES. That heavy one is a low silhouette tank, is it not, or is that just the way it looks here?

General SIMON. But they are successively heavier and they are successively bigger, sir.

Mr. SIKES. All right.

General SIMON. This tank is made primarily by taking the M–46, which has an approved chassis, and then slipping a new turret on it.

(Off the record.)

As was expected, some difficulties were experienced. These are now being corrected. However, it is estimated that the net result will be the gaining of about a year in getting tooled up for tank production.

(Discussion off the record.)

That is the long and short of the tank situation, but it is clearing up now and we will have a much better tank which will be by far the best medium gun tank in the world.

(Discussion off the record.)

TANK TRACK

You may be interested to learn our research and development program has brought forth a new tank track made of cold rubber, which has an endurance life equal to the steel track, 2,500 miles. Previous synthetic rubber tracks had a life of only one-third that amount. The cold rubber track is superior to the steel track in nearly all respects. It is cheaper and it releases critical steel for other purposes. As a result of this development the steel track previously required for every tank is being eliminated.

Mr. SIKES. Is that going on to the tanks now?

General SIMON. Synthetic cold-rubber tracks.

Mr. SIKES. For field use?

General SIMON. Yes, as well as for training. It is a cheaper track and lasts longer.

Mr. SIKES. That is excellent.

General MARIS. It saves steel.

Mr. SIKES. That is excellent. Go ahead.

General SIMON. In the wheeled-vehicles field the Ordnance Corps has completed development of an improved line of primary vehicles including the one-fourth-ton, three-fourth-ton, 2½-ton, and 5-ton trucks. These vehicles are presently in production. That does not mean, however, we have stopped the research and development on it, because they are in production. We are trying particularly to cheapen these vehicles.

During World War II, requirements of the Army (including the Air Force) for tactical-type trucks in the one-fourth- to 7½-ton range were met by 11 weight classes of vehicles with as many as five different manufacturers' types in a single weight class. Thus there were no less than 20 types of vehicles with this tonnage range having little, if any, interchangeability. The new line of primary vehicles, with our the four weight classes I have just mentioned, have this same tonnage range.

We are replacing 20 weight classes with 4.

Major components are interchangeable between weight classes, and items such as generators and voltage regulators are common to all four classes. This decrease in number of makes and classes of vehicles considerably lightens the burden on the parts supply and maintenance systems, effecting a substantial saving in shipping space, storage space, and maintenance manpower.

Mr. SIKES. I think that is highly commendable, but tell me at what stage this project now is. Have you actually made the substitution of the four types of trucks for the types that are now in use, or is this something that is still in the testing stage?

General SIMON. No, sir. We have made the substitution, but by no means are we all through the program.

Mr. SIKES. Is it contemplated you would be able to phase out all of the multiple types of trucks which you formerly have used?

General SIMON. We did phase that out. We have done that and we are down to where we are working on van-body types and various types, trying to effect a further simplification in this field. However, we have phased out the 20 classes and replaced them by 4.

Mr. SIKES. All right.

General SIMON. In addition to that we are working very hard trying to cut down costs associated with things like waterproofing and splash-proofing and radio suppression, and all the frills, to make those things cheaper. So the program is by no means completed. I am just pointing out the direction in which it has been going and the direction in which we hope it will continue to go.

Mr. SCRIVNER. Now will you discuss these vehicles in detail at a later time?

General SIMON. No, sir. I was not going into any more detail. I have moved along without noticing that they have brought in these charts, and I can show you a chart or two on it.

Mr. SCRIVNER. May I ask one question?

Mr. SIKES. Yes; and I think it would be appropriate to show a few charts as you go along.

MAINTENANCE OF TRUCKS

Mr. SCRIVNER. You are phasing out all these multiple types, which is in my book common sense. You will always have a period there which is a little bit awkward, where you are not quite out of it and not quite into the new program of your four standard types. You told us you are developing these things for economy and simplicity of supply and maintenance.

General SIMON. Yes, sir.

Mr. SCRIVNER. But some of these new vehicles are now in Europe; are they not?

General SIMON. That is correct.

Mr. SCRIVNER. Then your maintenance crews have not been properly trained because they are running into a great deal of difficulty in making the repairs and maintaining the new trucks, together with a shortage of parts. At least that is the report I get.

General SIMON. We are supplying these spare parts. This does not come in my field, but I am acquainted with it because General Ford has a research man and I am he, and he has an industrial man, General Cummings, whom you will meet later, and he has a field service man, General Kirk—you remember, the big fellow who is just retiring this month. That comes under General Kirk, but General Kirk has provided, so I understand from him, appropriate numbers of spare parts for these vehicles.

REDUCTION IN NUMBER OF ENGINES FOR TANKS

In 1952 we had five engines for the medium tank, the Pershing tank. Now under our new component system we have a single engine that goes into five vehicles, and we practically have reversed the process. The same basic engine goes into a medium tank, motorized artillery, and into tractors. We keep the vehicles uniform and keep the weight uniform, and in that way reduce the spare parts. I will have to go off the record.

(Discussion off the record.)

PERSONNEL CARRIER

General SIMON. During the fiscal year 1952 budget presentation this committee sharply criticized the T–18 Army infantry personnel carrier. The Army said it would do something about it. Two companies have been given contracts to build prototypes of substitute vehicles using cheaper components wherever possible and simplified construction designed for possible production at prices in the vicinity of $50,000 at the curb.

(Discussion off the record.)

Mr. SIKES. General, we will go ahead.

FIELD ARTILLERY

General SIMON. I would like to say a word about the new field artillery family. We had the 105-millimeter howitzer, the 155 howitzer and the 155 gun, and certain other phases of artillery. Studies were made after the war and we have a new field artillery family which is not yet at the proving grounds.

(Discussion off the record.)

LIGHTWEIGHT RIFLES AND MACHINE GUNS

General SIMON. Lightweight rifles and machine guns which fire a new caliber .30 cartridge developed especially for these weapons are in the advanced stages of development. This is known as the T–65 cartridge. It is 20 percent lighter than the regular cartridge, but it has exactly the same ballistics, the same weight bullet, and the same velocity, and the same killing power.

Mr. SIKES. How did you get the same ballistics with that smaller cartridge?

General SIMON. How did we get it out?

Mr. SIKES. What did you do?

General SIMON. It is very simple, sir. The older cartridge is something you have been stuck with because advantage could not be taken of powder development without obsoleting stocks of rifles on hand. We can now make better powders, but as you change your powder it obsoletes your rifles. We just improved our powder still more, and we knew we could do it. We took a pair of tin snippers and snipped out the section of this cartridge and pushed it together and moved it down. These two rounds of ammunition are just the same except that we took the air out of this one. The air got in there by improving our powder. It is really just that simple, and I am not exaggerating, sir. The new complete round is smaller and lighter than our standard caliber .30 ammunition, but has the equivalent muzzle energy and effectiveness. The most promising of these rifles, the T–47, which weighs between 7 and 8 pounds, is a potential replacement for the M–1 rifle, the carbine, and the submachine gun.

(Discussion off the record.)

Mr. SIKES. What is the real advantage of making this fully automatic? It seems to me you are encouraging a man just to throw away a lot more ammunition than he can otherwise by making this gun fully automatic.

General SIMON. You cannot get me to argue with you. In fact you cannot get the Chief of Staff to argue with you either. The Chief of Staff says if we adopt the fully automatic feature he is going to require that it be of such a nature that you can cut it out and the soldier cannot put it back on again without authority. We have developed that in response to the demands of the Army Field Forces. They want a fully automatic feature but the Chief of Staff says he does not want to risk that extravagant use of ammunition and is very likely to insist we be able to cut it out.

General MARIS. He said he would insist it be capable of being locked out.

Mr. SCRIVNER. He can get some backing on that from this committee.

Mr. SIKES. I think so, too. Go ahead and tell us about the rifle.

General SIMON. That is all there is to it. It has three features over the present Garand rifle—lightness, more rounds, and the fully automatic feature.

Mr. SIKES. How much less does it weigh?

General SIMON. About a pound and a half. Also there is a larger ammunition supply and the ammunition weighs less.

Mr. SIKES. Is this just in the test stage or are you actually going into it?

General SIMON. That is one of two we are submitting to the Feld Forces Board. It is very likely they will take one of the two. These are two out of about seven we had in the running. We have narrowed it down to two through our engineering tests and are going to give the two to the Army Field Forces and narrow it down to one.

Mr. SIKES. Why do you not give it a name instead of a number? No soldier wants to talk about a number. He wants a name. He wants to call it the "Simon," for instance.

General SIMON. I was going to suggest the "Sikes." There is a regulation that forbids naming anything after a living officer, but it does not mention Congressmen.

Mr. SCRIVNER. What is the other one being considered?

General SIMON. The Garand?

Mr. SCRIVNER. No. You said there is another one that is being considered.

General SIMON. The T–44. This is the T–47.

Mr. SCRIVNER. What is the difference between that and this one?

General SIMON. A difference in the receiver and bolt action. There is a differenec in the way they operate. I think the other one is a little more difficult to adapt to mass manufacturing than this may be. They are mostly technical differences.

Mr. SCRIVNER. And that would affect the cost?

General SIMON. The cost would be about the same as the Garand. I do not see any reason why one would cost more than the other.

Mr. SIKES. It has substantially the same operating principle as the Garand?

General SIMON. No, sir. There is a difference in the bolt locking action. I am not thoroughly up on those.

Mr. SIKES. What is the capacity of the magazines?

General SIMON. Twenty rounds to the magazine.

Mr. SIKES. Do you think the cost would be comparable with the Garand?

General SIMON. Yes, sir. There should be no significant difference in cost. We have no way of making an economy feature out of it.

Mr. SIKES. A pound and a half less weight would feel considerably better after a day of dragging it around on a mountainside.

General SIMON. The pound and a half weight difference is important to the soldier but it does not save us dollars.

Mr. SIKES. All right. What is next.

General SIMON. I would like to go to budget activity 1200 now, "Air defense matériel and techniques." That is on pages 19 to 25, inclusive.

FRIDAY, FEBRUARY 29, 1952.

Mr. FLOOD. We are in the middle of the statement being made by General Simon, who is presenting the Ordnance picture here, when we recessed yesterday afternoon. I believe you had finished your original statement.

General SIMON. I have a few remaining things here that have to do with the field of mines.

(Discussion off the record.)

ORDNANCE AIR DEFENSE MATÉRIEL AND TECHNIQUES

General SIMON. The next item is budget activity 1200, "Air defense matériel and techniques." By far the biggest item associated with air defense is guided missiles. That will be covered separately by our very able colleague, General Mickelsen, and his supporting command. That takes nearly one-third the weapons dollar. I will cover only their air defense techniques.

I would like to ask you to make a correction on your sheet. Where it shows 1951, that should be $26.8 million; fiscal 1952, $62.3 million; in 1953 it should be $56 million and not $55.4 million.

This activity covers antiaircraft weapons and ammunition, surface-to-air guided missiles, and fire-control equipment for air defense operations.

In the antiaircraft artillery field, you are already familiar with the new Skysweeper which is now in production and which was shown to the committee during the presentation by the Secretary of the Army.

(Discussion off the record.)

General SIMON. As in the case of the land combat activity, I would like to reserve discussion of surface-to-air guided missiles for General Mickelsen.

This activity also includes provision for continued development and perfection of the T–33 antiaircraft fire-control system and associated power systems.

Mr. FLOOD. In this whole field in which you operate, do you mostly develop foreign basic scientific inventions, or are you a basic scientist in your shop?

General SIMON. If you will permit, I intended to give a little talk on that right at the end. We skipped it at the beginning yesterday because we did not have some charts I would like to show you as to how we function.

Mr. FLOOD. I ask that question only because during the debates of the last 6 or 7 years in the House on the Science Institute bill proposed by Congressman Priest, which has just passed the House, all of the debate and extensive debate on a very high level indicated that our scientific people traditionally had never contributed materially, except here and there, to basic science, but we do a great job in the development of somebody else's ideas.

General SIMON. We do both. I would like to show you how that all fits together and what we are doing, and we are very ably supported in that by Dr. Vannevar Bush.

(Discussion off the record.)

COMPLEXITY OF OPERATION AS A RESULT OF RESEARCH AND DEVELOPMENT

Mr. FLOOD. Before you leave antiaircraft, let me ask, as good as you say all of this is, as complicated and as expensive as it is, are you creating such a situation as this: Are you producing things which make it a condition precedent to use that you have to be a graduate electrical engineer or something?

General SIMON. Although it is becoming more and more complicated, we try to keep this as simple as we can and try to specialize crews for maintaining it so that the soldier in the field does not have to have things more complicated than we can avoid. But I do think

the requirements of the individual soldier are increasing from day to day.

Mr. FLOOD. We know that; that is true generally; but in your Department are you going ahead and doing certain commendable, desirable, and wonderful things which when you turn them out in bulk and they are operational, you are not going to be able to get people to operate?

General SIMON. That is one of the things we bear in mind; that is, the matter of simplicity, not only in operation but in maintenance. That is why we put in here "effectiveness." It has to be effective in the hands of the command; it has to have ruggedness so it stands up, and it has to have simplicity so that you can operate it.

Mr. FLOOD. Were you in the Army in London during the blitz?

General SIMON. Yes, sir.

Mr. FLOOD. Did you see those female gun crews?

General SIMON. Yes, sir.

Mr. FLOOD. And they were good.

General SIMON. Yes, sir.

ORDNANCE AIRBORNE LANDING, AMPHIBIOUS, SUPPLY AND MAINTENANCE, MATÉRIEL AND TECHNIQUES

The next is budget activity 1300, "Airborne landing, amphibious, supply and maintenance, matériel and techniques."

The fund requirements in this area include continued development of the 90 millimeter airborne gun motor carriage, amphibious vehicles, trailers, and flotation devices. Provision is also made under this category for development of vehicles required for administration and supply and maintenance activities. Funds required for this latter purpose are divided fairly evenly over approximately 18 items which are vitally required. Included are administrative vehicles, cargo trucks, trailers, vans, and wreckers. Emphasis will also be placed in fiscal year 1953 on standardization of components to increase interchangeability, and simplification to reduce costs.

(Discussion off the record.)

ORDNANCE PERSONNEL, INTELLIGENCE, AND PLANNING OPERATIONS

General SIMON. The next is budget program 1500, "Personnel, intelligence, and planning operations."

The Ordnance request under this activity is approximately $1,200,000 for 1953. As you see, comparable small amounts were obligated for this activity in previous fiscal years. 1953 funds will be used primarily for development of training devices such as artillery simulators, training devices to test gunners, and, accounting for $1,000,000 of these funds, target aircraft.

(Discussion off the record.)

ORDNANCE SUPPORTING RESEARCH AND OTHER OPERATIONS

General SIMON. The next is budget project 1600, "Supporting research and other operations."

This activity primarily provides for supporting research in Ordnance, including guided missiles. The guided-missiles portion, or

$17 million, is indicated separately on the chart. The funds requested for 1953 include provision for research in such fields as internal combustion engines; ballistics; propellants; explosives and pyrotechnics; guided-missile flight instrumentation; guided-missile components; plastics; metals, including titanium; fuels and lubricants; and many others. Funds are also included for basic research in numerous other fields of vital interest to the Ordnance Corps.

One of the major fields in which the Ordnance is engaged, and one of the most expensive, is that of guided missiles and rockets. General Mickelsen will give you a quick review of all Army guided missiles and the large rockets.

This completes the review of the Ordnance Corps portion of our research and development budget. As you will have observed, the Ordnance Corps carries the weight of the Army's research and development effort in the costly heavy weapons, vehicles, and guided missiles fields which have such a direct bearing upon the combat effectiveness of our ground forces. The 60 percent of the Army Research and Development budget which is allocated to the Ordnance is consistent with the major combat role which must be assumed by ground troops in any war of the foreseeable future. Before we move on the field of guided missiles, I, or my assistants, will endeavor to answer any detailed questions which you may have regarding the Ordnance program.

Guided Missiles

General Maris. I should like to have General Mickelsen proceed with the guided-missile phase of this program.

Mr. Flood. You may proceed, General.

General Mickelsen. I am Brig. Gen. Stanley R. Mickelsen, General Maris' deputy for special weapons. That includes guided missiles and weapons to deliver atomic war heads.

The Department of the Army's guided missiles research and development program is being carried out to develop improved weapons in the surface-to-surface and surface-to-air fields and to conduct the necessary supporting research to round out the program. Through December of 1950, the Army's program was proceeding at a relatively low level of activity consistent with the Army's requirements and the funds available. The entire Army program in fiscal year 1951 totaled $45,686,176. With the advent of Mr. K. T. Keller, Director of Guided Missiles, Office, Secretary of Defense, in the fall of 1950, the Army's program was reviewed by him and the Research and Development Board and certain portions were accelerated, some to almost a crash basis and some to a highly accelerated rate. The others remained at the same level previously established. As a result of the various accelerations, the program in 1952 totals $99,487,657.

The program to be presented here today is a continuation of these missile projects at the level approved by the Research and Development Board and the Secretary of Defense. In 1953, as a result of proposed increases and decreases in activity of certain projects and the initiation of new projects, the money value of this program is $98,100,113. The over-all level of effort in fiscal year 1953 is therefore approximately that which is included in the present 1952 budget.

There are two technical services involved in the development of guided missiles; the Ordnance Corps and the Signal Corps. The Ordnance Corps has over-responsibility for the development of guided-missiles systems. The Signal Corps acts in a supporting role by providing electronic instrumentation and development of electronic devices and communications.

On page 6, tab 1, of the justification of estimates, activity 1100, "Land combat, matériel, and techniques," there are listed under No. 1130, guided missiles surface-to-surface launching devices, control and guidance systems totaling $50,831,921. The objective of this project is to provide antitank weapons and weapons capable of delivering atomic and conventional warheads to targets which are appropriate for long-range artillery and piloted tactical aircraft. These missiles will supplement and eventually replace much of the long-range artillery and tactical air support. These weapon systems will provide commanders of field armies with flexible, all-weather means of supporting their operations. The specific missile programs included in this project are listed on page 1 of tab 8. I shall now discuss the individual missile programs in project 1130 and shall inform you of the progress and results of our research and development effort during the past year.

Mr. FLOOD. How long have you been on this job, General?

General MICKELSEN. A little over 2 years.

Mr. FLOOD. And where did you come from to this job?

General MICKELSEN. From Fort Sill, Okla.

Mr. FLOOD. What was your job there?

General MICKELSEN. I was assistant commandant of the school.

Mr. FLOOD. Are you an artillery officer?

General MICKELSEN. I am, sir.

(Discussion off the record.)

General MICKELSEN. On page 19, tab 2, under the activity 1200, "Air defense matériel and techniques," there are listed "Guided missiles, surface-to-air and associated equipment." The estimated cost for 1953 is $28,532,918. The objective of the Army's guided-missile program in this field is to provide weapons which will be capable of destroying enemy aircraft at all altitudes up to 80,000 feet and at ranges several times those possible with conventional antiaircraft artillery. This program requires different weapons for high and low altitudes. These two types of weapons will extend the capabilities of and replace much of our conventional antiaircraft artillery and are designed to provide the necessary protection for the air defense of continental United States and the armies in the field.

On page 2, tab 8, are included the surface-to-air guided-missile projects within project 1220, "Guided missiles, surface-to-air and associated equipment."

I shall now discuss the individual missile programs in project 1220 and shall inform you of the progress and results of our research and development effort during the past year.

(Discussion off the record.)

PUBLICATION OF GUIDED MISSILE STORIES

Mr. SCRIVNER. General, although heretofore we have discussed a certain ground-to-air missile, all of which discussion has been off the record, only yesterday, I believe it was, or the day before, a newspaper article appeared which gave in great detail the story of the use of this weapon and the results which were thereby obtained.

On behalf of the committee I am requesting now a full and complete investigation of the manner in which the story was released, the source of the story and what if any disciplinary action has been taken or will be taken against those who are responsible for its release. Because any person who is so lacking in his attitude toward the security of this Nation is no longer fit to be in the Government service either as a civilian or a member of the Military Establishment and in my opinion should be summarily dismissed or even greater disciplinary action should be taken.

Do you have any comment you wish to make on that?

General MICKELSEN. No, sir. I agree with that.

Mr. FLOOD. Except I would like to add that investigation should also include the man who wrote the story and the paper that published it.

Mr. SCRIVNER. I do not think you can blame the man who wrote the story.

Mr. FLOOD. If this is as hot as it is supposed to be, then certainly, one bady story can wipe out 10 years of great performance, and there is some responsibility upon a reporter who is sufficiently acquainted with Government practice that he should have been aware that this thing was so sensitive as to have placed him on inquiry. And if he has not that sense, certainly the city editor or the publisher or some other person should assume that responsibility on the part of the newspaper.

Mr. SCRIVNER. Of course, that is beyond our realm. When I read this story, I felt as I have felt about some other releases, such as the release of the story by the Air Force on the Matador and many others, that if the security was so great as this committee has been told, then it should not have been released and, if it was not that great, then you have been flimflamming this committee on this information and a lot of things, under the cloak of secrecy, which did not need such a cloak.

It probably is not in your province, General, to undertake the request that has just been made, but certainly I expect you and others here to convey this to the proper authorities and let them know what the sentiment of the committee was.

Mr. SIKES. General Mickelsen, I believe you had not completed your statement. Will you proceed, please.

General MICKELSEN. Mr. Chairman, I ended this morning my on-the-record discussion of the surface to air-guided missile. I desire to go off the record now and tell you what we have done and what the status is.

Mr. SIKES. Very well.

(Discussion off the record.)

General MICKELSEN. On page 46, tab 6, there are included funds for supporting research in guided missiles totaling $18,735,274. The funds under this project title are to be used for basic and applied re-

search and development of guidance systems for missiles, ballistic studies, equipment for the test of guided missiles and rocket motors at laboratories and ranges. It also included the evaluation and development of chain radar beacons, controlled missile equipment and techniques. Funds required for the instrumentation and data reduction are also provided. This is all the supporting work that goes into the missile design, including research.

The funds included in this budget for our guided missile research and development will continue our programs at the levels of activity authorized by the Director of Guided Missiles, Office of the Secretary of Defense, for the Army programs. The progams are progressing at satisfactory rates and are in consonance with program schedules planned by the Army and with the availability of scientific personnel. It should be pointed out that most of the research and development work is being conducted by private industry for the Army. The major contractors engaged in the programs are Western Electric Co. with its Bell Telephone Laboratories, General Electric Co., the Jet Propulsion Laboratory of California Institute of Technology, Cornell Aeronautical Laboratory, Fairchild Engine & Airplane Corp., and Radio Corp. of America.

That concludes my presentation.

Mr. SIKES. Thank you very much, General Mickelsen.

General Maris, what is your next presentation?

General MARIS. General Simon has a gentleman here he wishes to present.

General SIMON. I have General Maris' permission to introduce to the committee my very able subordinate, Colonel Toftoy.

Colonel Toftoy was brought back from the European theater at the beginning of the guided missile program. The whole Army guided missile program has been under his immediate supervision from its inception up to now. He is the man who worked on it when we were running on a shoestring and he is the one who went through building up a place like White Sands and gathered together the odds and ends picked up at Albuquerque and elsewhere to get the proving ground started.

Colonel Toftoy won't be with you again because his term is running out and we will be issuing orders in the next 2 months transferring him some place else. But here is the man who has done the work—Colonel Toftoy.

Mr. SIKES. Colonel, that is a very fine introduction and I am sure it is merited.

We will be glad to have you tell us anything you want to about this extremely important work.

Colonel TOFTOY. I think General Mickelsen covered the details of the program very well. I would be glad to answer any specific questions you might have. I know you have a lot to cover.

My only plea is that we get proper support to put this program across now. It is expensive now, but I know the further we get along with it the simpler and more reliable and cheaper we will be able to do this thing. We are pioneering in a brand new field. This is a new field of American technology. Supersonic aerodynamics is just as different from subsonic as d. c. electricity is from a. c. There are many things we do not fully understand as yet that have been estab-

lished through research and experiment, and are definitely going to be improved as time goes on and we will understand them better.

I think the one thing I would like to leave with you is that we should not become discouraged either from the early costs or early problems. As I have warned some of the people in the Pentagon recently, after very encouraging results in our tests, I feel we have demonstrated that we have a system capable of meeting the Army's requirements and doing the job, but there is a lot of work left to be done. We are going to emphasize reliability in the next few years. And let us not get discouraged too soon in a field such as this.

I think there will be great progress in the next 10, 15 or 20 years. We do not want to expect too much from one year to another, and, of course, since they are my babies I am most happy to see them earn their wings. I feel we are right on the threshold now and guided missiles are going to be extremely important to the security of this country.

Mr. SIKES. We are concerned with costs, of course, but it is very probable—almost certain, in my opinion—that in this field we must be more concerned with results. It is necessary that we have results. If the time should come in the next few years that guided missiles can make aircraft operation unsafe, I do not want this Nation to be the last one to find out how it is done. So we have to have results if results are obtainable.

In your opinion, Colonel, if you can look at it from the standpoint of a man who does not know this thing backwards and forwards like you do, are we developing these weapons so that they are simple enough and sturdy enough that for all practical purposes the weapons and the whole program won't collapse of its own weight by virtue of its being so complicated that you cannot supply the parts or find the people to operate them?

Colonel TOFTOY. Yes, sir. As you know, we have called in industry to get the best brains available to us in the country and one of the things we do is to impress on those people in industry that this is to be used in warfare under rugged conditions with the average type of manpower we have in the Army, plus a small number of experts; that we cannot hope to man the batteries which shoot these things with a large number of Ph. D.'s such as a laboratory is doing in their own work. So one of the things we are emphasizing is, first of all, the weapon has to work for the Army under Army conditions; secondly, we must simplify rather than add to the complexity.

In this connection you might be interested to know that every missile project does have technical problems and one way to get at the technical problems is to add to the complexity by, let us call it, crutch engineering; but I would rather see them take an extra 3, 4, 5, or 6 months to redesign a circuit and make it simpler rather than to add to the complexity merely to get out of trouble.

I think that is one reason why our missiles have been as successful as they are. I feel that having had, up to the beginning of this fiscal year 1952, only 17 percent of the Nation's guided-missile funds, that we have really done better than could be expected in this regard. I feel we will make these things simple and rugged enough to work. I fear only what will happen if we become discouraged too soon. Being so new, we cannot make missiles as simple today as we will be able to do

in a few years, but this is what we are striving for. And reliability is the one thing which we have added to the program and are putting the greatest emphasis of all on that.

Mr. SIKES. What do you know about the Russian development of guided missiles?

(Discussion off the record.)

Mr. SIKES. Thank you very much, Colonel; it has been very helpful.

General MARIS. Mr. Chairman, yesterday the committee expressed a desire to talk to Dr. Johnson, head of Operations Research Office, in connection with the statement General Simon made on the tank program. Dr. Johnson is here to discuss and answer any questions you may have in connection with the tank program.

Mr. SCRIVNER. We didn't necessarily limit it to questions about the tank program alone.

Mr. SIKES. Have you any statement at this time, General Simon?

General SIMON. No, sir. I will be glad to try to answer any questions, if you wish.

Mr. SIKES. It is not necessary.

Dr. Johnson, let me assure you this committee is very glad to have you with us this afternoon. We need all the information we can get that is helpful to us.

I understood you had made some close and recent studies that may be helpful to us. We will be highly appreciative to get anything you can tell us about our weapons in Korea and our enemy's weapons, and their comparative effectiveness.

Dr. JOHNSON. It is true we have had a considerable number of people doing research in Korea for the Army. I think it is worth while outlining at least to some extent what we are doing.

(Discussion off the record.)

MONDAY, MARCH 3, 1952.

SIGNAL CORPS RESEARCH AND DEVELOPMENT PROGRAM

Mr. SIKES. You may proceed, General Maris.

General MARIS. We are ready to proceed, Mr. Chairman, with the Signal Corps portion of research and development and I should like to present Col. Cary J. King, Chief of the Engineering and Technical Division, Office of the Chief Signal Officer.

GENERAL STATEMENT OF THE CHIEF ENGINEERING AND TECHNICAL DIVISION, OFFICE OF THE CHIEF SIGNAL OFFICER

Mr. SIKES. Colonel King, we shall be glad to hear you at this time.

Colonel KING. Mr. Chairman and gentlemen, I am Col. Cary J. King, Jr., Chief, Engineering and Technical Division, Office of the Chief Signal Officer.

The proposed Signal Corps Research and Development Program for fiscal year 1953 totals $53.6 million. This compares with the fiscal year 1952 program of $50.3 million and the fiscal year 1951 program of $45.8 million. This program is a result of a careful screening of research and development proposals amounting to more than $90 million. Emphasis is to be placed on projects which will

provide radically new items for the field army; result in lower cost items for the Army; conserve critical materials and reduce maintenance cost of equipment.

This budget requests authorization for 3,367 personnel. This is the number currently authorized. At the present time we have on hand 3,212 personnel.

As I go through each of the Signal Corps research and development budget projects, you will notice that certain ones have had large decreases while others have had corresponding increases. However, it should be borne in mind that the over-all research and development program remains at approximately the same level as the current program. In budget projects where there are decreases, the personnel have been transferred to budget projects where increased emphasis is required.

In the technical fields, the program has shown increases in the field of thermionics, communications, electronic countermeasures and application of transistors. In thermionics, this increase is generally due to more emphasis being placed on reliability and on the development of special tubes for countermeasures application. In the communications field, the major portion of the increases are to provide for development effort on the new division switchboard and a new open wire telephone carrier system which, if successful, will save up to 75 percent of the copper currently being used in military open wire telephone systems.

To give you an idea of the magnitude of this saving; during 1944, the Signal Corps used 52,000 tons of wire for this type of communications, costing $52,000,000. With these new carrier systems, our requirements for copper for this use will be cut to 5,000 tons and $6,000,000.

This fiscal year 1953 program in Signal Corps research and development is within the technical capabilities of our laboratories to perform. It is a well-balanced program taking into view available personnel and facilities, need for present and future economy, and development feasibility of proposed new equipment desired by the using forces.

This chart shows that of the total of $53.6 million proposed for the fiscal year 1953 program—

(*a*) 46 percent or $24.3 million is contractual with industry.

(*b*) 12 percent or $6.7 million is contractual with universities.

(*c*) 30 percent or $15.9 million is for wages and salaries of the 3,367 civilian personnel.

(*d*) The remaining 12 percent or $6.7 million is for supplies and materials used by the laboratories for research and development purposes.

With the committee's permission, I will proceed to discuss the major budget activities involved in this program, as shown graphically on the chart now before you.

This activity [indicating] contains the majority of the Signal Corps projects for the development of wire and radio communications and radar equipment for land combat use. During fiscal year 1951 and the first half of fiscal year 1952 a study on the development of a radar equipment for artillery locating has been completed and plans made for the fabrication of a model of equipment.

We are planning to initiate development on a new multichannel open-wire carrier system in fiscal year 1953. The present 4-channel system uses one pair of an open wire line and the 32-channel system will use two pairs.

This chart shows the substantial economies which can be expected with the new 32-channel system using two pairs—that is, four wires—in place of the current open-wire system of the same capacity which required 8 pairs or 16 wires. This system will also replace carrier cable systems in many instances with considerable savings. For example, carrier cable systems cost in the order of $2,500 per mile for cable. The cost of wire for an equivalent open wire system would be under $500 per mile.

Significant accomplishments have already been made in the form of economy and conservation of critical materials in this same area. For example, a new carrier cable placed in production provides three times as much message handling capacity as the former type while using approximately 35 percent less copper. Replacement of a neoprene jacket on this cable by an improved synthetic rubber compound produced a saving cost of $65 per mile. An annual reduction of 600,000 wire reels at $6 each has been brought about by this reduction in volume of the new field wire as compared with World War II standard.

The transistor represents a tremendous potential advancement in the electronics field as compared to radio tubes for accomplishing the same result. It has been vastly improved and its development accelerated as a result of the work supported by the Signal Corps. Besides being miniature in size, it is highly efficient in use of power having no filament to heat up. It is just beginning to be available to design engineers in limited quantities and plans for quantity production are being hastened.

Here is a transistorized version of frequency shift converter CV–115/URR a radio-to-teletype interconnection device. Its weight and size are about one-tenth that of the old. It uses only two watts of power, or roughly one one-hundredth as much as the old equipment which employes vacuum tubes. It is expected to cost about $75 in the small quantities needed. The replaced item with its power supply costs over $500.

GOVERNMENT AND COMMERCIAL DEVELOPMENT OF TRANSISTOR

Mr. SIKES. Referring to the transistors, is there a place in industry for them?

Colonel KING. Yes, sir.

Mr. SIKES. Is industry interested in their development, or does the Government have to carry all the load?

Colonel KING. We are carrying a portion of the load. The Bell System did develop, has developed most of it, under its own financing. We have been interested in the application of the transistor in one of our devices.

(Off the record.)

Mr. SCRIVNER. We have been hearing about this transistor program for 5 or 6 years. When did you first talk about this, about 1947?

Colonel KING. 1948.

General MARIS. It is just now beginning to pay off, sir. Most of the money that has been put into this has been put in by the Bell Laboratories. General Electric and others working on various types of transistors.

PHASING-OUT OF RESEARCH AND DEVELOPMENT PROGRAMS

Mr. SCRIVNER. Now that private industry is interested in it and can see the value of it, is this one of the programs in which eventually you will show a tapering off?

Colonel KING. We are just getting started, sir. I would like to show you a photograph of the transistor——

Mr. SCRIVNER. The point that I was leading up to is this. Since I first came to this committee, we have been hearing about many of the same items. Many of these items are still in some of your programs. Someone, General Collins or perhaps Secretary Lovett, said that the Army is prone to keep their hands on everything that is old and to grab everything that is new. That has been my own observation and experience with your research and development. You seem never to drop any of the old programs and are always reaching out into new programs. Sometime, somewhere, you would be in a position of being able to drop some of these older programs, if you are going into new programs all the time.

Colonel KING. I believe I have here an example of what you are seeking, sir. I have here a photograph of a transistorized version of a teletypewriter converter. The picture on the left is the teletypewriter converter that has been the standard up to now. On the right is the same unit incorporating the transistors in its operation.

I had this unit here on Thursday and Friday, but I had made a commitment to display it to the Institute of Radio Engineers Convention today, so I sent it up to New York for that purpose and expected it to be something of a feature of the convention.

Mr. SCRIVNER. Your photograph will not show in the record, but I would judge from looking at it that this new one is reduced in size by something of the order of—how large would you say the new one is?

Colonel KING. The new one is about 6 by 6 by 10.

Mr. SCRIVNER. About one-tenth as large as the old one?

Colonel KING. Yes, about one-tenth as large as the old one; and its weight is about one-tenth as much as the old one.

I have a model of the old equipment here. I do not have the power unit with it. It is far too heavy to be handled conveniently by one man or even two. This one can be handled by one man.

The power unit itself weighs more than this does.

In the transistorized version all that is needed is just this little group of dry cells, this small bank of dry-cell batteries, which will take care of the power for this equipment.

This, of course, is not of such tremendous importance in a piece of equipment such as this, which is associated with a radio receiver and operates into a teletypewriter that converts radio signals into the signals that will actuate the teletypewriter. There is power required for the radio receiver and there is power required for the teletypewriter.

The tubes in this set are completely replaced by transistors. And as we get a higher powered transistor we will be able completely to re-

place the tubes in the handy talkie, and tremendously reduce the weight that is involved in that piece of equipment and the weight involved in shipping the batteries themselves that are necessary to operate it.

Mr. SCRIVNER. There has been considerable progress made in the reduction of the weight of the handy talkie; has there not?

Colonel KING. Yes, sir.

Mr. SCRIVNER. On the very first visit that I made to your laboratory at Fort Monmouth, we were given very glowing reports on the progress in miniaturization of the various items that went into the handy talkie. That was several years ago which emphasizes again the point that I was trying to make, that eventually, so far as research and development is concerned, some of these programs should soon come to a fairly satisfactory conclusion; perhaps not the *n*th degree of perfection, but at least a reasonably satisfactory stage of development.

General MARIS. May I add a comment to that, sir?

Mr. SCRIVNER. Surely.

General MARIS. The transistor itself is just now beginning to reach the point where it can be used in many items of equipment. The next problem is to replace the more expensive high-cost vacuum tubes which required considerable power. The field of the use of the transistor is just now beginning to open up.

Mr. SCRIVNER. So that now you are just at the stage of the development of the transistor, where you think you will be able to use it?

General MARIS. Use it in all types of equipment, yes, to replace vacuum tubes.

Mr. SIKES. Continue, Colonel.

SIGNAL CORPS ACTIVITIES UNDER AIR DEFENSE MATÉRIEL AND TECHNIQUES

Colonel KING. Under budget activity 1200 we have $10.5 million for the fiscal year 1953.

This budget activity contains the Signal Corps research and development projects for new communications equipment, data-transmitting equipment, electronic-countermeasures equipment, high-power vacuum tubes, guided missile trackers, radar-picture-transmission equipment, multichannel carrier terminal and repeater equipment, multichannel radio sets, fire-direction systems, surveillance radar sets, and guided-missile countermeasures equipment used in air defense operations.

In fiscal years 1951 and 1952 models of new 4- and 12-channel carrier terminals and repeaters have been completed and production will start within the next 9 months. New 12- and 24-channel radio-relay equipment have been developed and production will begin in the next 6 months.

If I may go off the record again, sir?

(Off the record.)

SIGNAL CORPS, AIRBORNE LANDING, AMPHIBIOUS, SUPPLY AND MAINTENANCE MATÉRIEL AND TECHNIQUES RESEARCH AND DEVELOPMENT

Colonel KING. Budget activity 1300: This budget activity contains the Signal Corps research and development work in the field of new switchboards, wire, radios, teletypewriters, and batteries for airborne and amphibious landing operations. During fiscal year 1951 and the

first half of fiscal year 1952 new models of lightweight teletypewriters have been completed, and models of site marking and locating devices for use in assembly of airborne troops are being evaluated. It is expected that a new field telephone will be completed before the end of the fiscal year. Here is a model of this telephone, the TA–1. This is a compact, lightweight, sound-powered, field-type telephone. It does not require batteries and will be used in the front lines. It can be submerged in water without damage. It should cost under a hundred dollars.

SIGNAL CORPS RESEARCH AND DEVELOPMENT ON ATOMIC, BIOLOGICAL, AND CHEMICAL WARFARE

Budget activity 1400, "Atomic, biological, and chemical warfare": This activity covers Signal Corps work in the development of radiation detection instruments and techniques. During fiscal years 1951 and 1952 new personnel dosimeters were placed in production. These are small individual self-developing film packs. A radiological field laboratory for use in areas which have been contaminated by explosion and portable survey equipments for detection of radiation have also been developed.

The fiscal year 1953 program provides for further work in the development of these and kindred items.

SIGNAL CORPS RESEARCH AND DEVELOPMENT ON PERSONNEL, INTELLIGENCE, AND PLANNING OPERATIONS

Budget activity 1500, "Personnel, intelligence, and planning operations." We have $6.5 million for the fiscal year 1953.

This provides for research and development on new and improved equipment for collection of intelligence information, equipment for counterintelligence methods and techniques, electronic mapping and charting, and meteorological equipment.

The fiscal year 1953 program includes development of radio sets for intelligence use, on the radio intercept and radio-direction-finding fields, special-purpose direction-finding equipment for the air-sea rescue service, recorder-reproducers, electronic-ground-survey equipment, meteorological balloons, radiosondes, weather-station equipment, and ballistics computers.

Mr. SCRIVNER. Are we going to have more details on this 1500 activity?

Colonel KING. That is the presentation, but I would be glad to furnish such other details as you may wish.

Mr. SCRIVNER. This is one of the fields in which you have made a rather marked increase in your request for funds, going from $4 million to $6.5 million?

Colonel KING. Yes, sir.

Mr. SCRIVNER. That is more than a 50-percent increase. What is the justification for that rapid climb?

Colonel KING. I should like to make this statement off the record.

(Off the record.)

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SIGNAL CORPS RESEARCH AND DEVELOPMENT ON SUPPORTING RESEARCH AND OTHER OPERATIONS

Colonel KING. Budget activity 1600, "Supporting research and other operations." Future advances in the art of electronics and the development of radical new items depend upon a strong research program in science of particular interest to the military. The Signal Corps program in research covers the field of physics, chemistry, and electronics.

These programs are conducted both internally at Signal Corps laboratories and externally at leading universities, industrial, and Government facilities.

I will be glad to expand on that, if you like.

Mr. SCRIVNER. I think you should. That is one of your largest items. In addition to the problems involved in research and development, we still have the difficult problem of funds and if you could put in a little research and development to make the tax dollar more easily available and expandable, then you will start hitting some pay dirt.

General MARIS. This particular activity includes a project which I should like to mention off the record.

(Off the record.)

Mr. SIKES. What are some of the other activities carried on in the 1600 series?

Colonel KING. I have some material that can go on the record if you would like.

The Signal Corps research program is conducted both internally at Signal Corps laboratories and externally at leading universities, industrial, and Government facilities.

The preponderance of Signal Corps effort in basic and applied research is of immediate and equal interest to the Departments of the Navy and Air Force and is closely coordinated with their research and development agencies. In some cases direct fiscal support is received, and in other cases sharing of the benefits is arranged by reciprocal arrangements calling for division of workload. Agreements are made for sponsorship and administration of individual contracts covering phases of the program. Major advances were made in the field of application of correlation techniques to radar, communications, and countermeasures equipments. These advances indicate possibilities for major improvements in the effectiveness and realiability of many equipments in cited fields. Major advances were also made in the application of statistical theories to communications.

(Discussion off the record.)

"G STRING" THEORY OF SURFACE WAVE TRANSMISSION OF ELECTROMAGNETIC PROPAGATION

Colonel KING. An interesting example of internal basic research was the announcement of the Signal Corps in fiscal year 1951 of the "G string" theory of surface wave transmission of electromagnetic propagation. Applied research studies are continuing on this theory. This theory is startling in its extreme simplicity and effectiveness. By its application it will be practicable to replace expensive waveguides

or coaxial cables in electronic equipment. This theory was developed by Dr. Goubau, of the Signal Corps engineering laboratories.

Then we have done quite a bit of work in the battery field.

Mr. SCRIVNER. Let us have a little more detail on this coaxial cable development.

(Discussion off the record.)

SYNTHETIC MANGANESE DIOXIDE FOR DRY BATTERIES

Colonel KING. Another example of research is synthetic manganese dioxide for dry batteries. During the past the African Gold Coast was the source of manganese dioxide for batteries. Batteries made from ore mined from domestic sources gives capacities much inferior to African ore. As a result of our work, it is now possible to process domestic ores and produce a synthetic manganese dioxide that gives from two to three times the capacity of African ore. A source—Electro Chemical Co. of Nevada—for this synthetic manganese dioxide is being developed which will be capable of supplying present military requirements. It is expected that by the end of calendar year 1952 this source will be supplying a high-grade material.

Mr. SIKES. Where is that source?

Colonel KING. I am not definite on that.

Mr. SIKES. Will you determine and inform the committee?

Colonel KING. Yes, sir; I will be happy to do so.

(The information requested is as follows:)

The Electrochemical Co. at Henderson, Nev., is producing electrolytic manganese dioxide from ore obtained from the Three Kids mines in the immediate vicinity.

Colonel KING. In terms of battery cost, the use of the new synthetic manganese dioxide will increase battery cost about 10 percent but with the resultant capacity increased from two to three times.

Although the cost per battery is slightly higher, the increased battery life obtainable produces a net reduction of approximately 50 percent in numbers of batteries needed and permits tremendous savings in shipping, storage, and supply.

Mr. SCRIVNER. When will we start getting dividends from that expenditure?

Colonel KING. We should start getting dividends next year. We expect this plant to be producing by the end of this calendar year.

Mr. SCRIVNER. Then it will take some time before the actual application on a use basis?

Colonel KING. Yes, sir.

(Discussion off the record.)

MAGNESIUM CAN DRY BATTERY

Colonel KING. In regard to the magnesium can dry battery, the well known flashlight dry battery uses a zinc can. Zinc is one of our country's most critical metals, and domestic sources are being rapidly depleted. Over 60,000 tons annually were used in dry batteries during World War II. Therefore, after the end of the hostilities of World War II, we embarked on a research and development program to find a noncritical substitute for the zinc anode used in dry batteries. A

number of such metals were considered as a substitute, with magnesium being considered the most promising. This development has shown promise not only from a critical materials standpoint but has shown that double to triple capacities over the zinc can battery of equivalent size can be obtained and at approximately the same cost. Extensive field tests of this battery are planned during calendar year 1952 in the European command and in the zone of interior. Because of the great increase in capacity obtained from the magnesium can battery, the monetary savings will be considerable. For peacetime procurements this will amount to millions of dollars and under emergency conditions will be in terms of tens of millions of dollars.

(Discussion off the record.)

Mr. SCRIVNER. You made a rather startling statement as to how much is going to be saved. You said in times of emergency it would run into tens of millions of dollars.

Colonel KING. Yes, sir. The dry-battery program is a very expensive one.

Mr. SCRIVNER. Do you have some figures on which you base your conclusion?

Colonel KING. No, sir; I do not have them with me. I will be very glad to supply them.

Mr. SCRIVNER. That is such an astounding and encouraging statement I would like to see some of the facts.

Colonel KING. Yes, sir.

(The information requested is as follows:)

Magnesium can dry-battery replacement of zinc can dry battery, estimated savings

1945 total dry-battery procurement (approximately)	$77,000,000
1947 total dry-battery procurement (approximately)	6,000,000
Average war-year dry-battery procurement, 1942–45 (approximately)	[1] 45,000,000
Average peacetime dry-battery procurement, 1946–50 (approximately)	[2] 8,000,000

[1] $22,400,000 magnesium batteries have same capacity as $45,000,000 zinc batteries.
[2] $4,000,000 magnesium batteries have same capacity as $8,000,000 zinc batteries.

Therefore, based upon an emergency wartime requirement equal to the average yearly requirement during World War II (1942–45), the annual yearly savings would equal $22,500,000. For an average peacetime year based on 1946–50, the annual yearly savings would be $4,000,000.

NOTE.—Magnesium can batteries have at least twice the capacity of zinc can batteries. The cost of the magnesium battery is expected to be approximately the same as the zinc battery.

(Discussion off the record.)

Mr. SIKES. Does that complete your presentation, Colonel, or do you have other material?

Colonel KING. I have some material here. I have an answer on the question of the production of electrolytic magnesium dioxide. This is being performed by theElectrochemical Co. at Henderson, Nev., on ore that is being processed obtained from mines that are close by, the Three Kids mines, I understand, in the immediate vicinity.

That completes my presentation.

COORDINATION OF COMMUNICATIONS RESEARCH

Mr. SIKES. Are there duplications either within the Army's R and D program or within R and D programs of the other services in any of these items you have discussed?

Colonel KING. I believe I discussed some items which are carried on in coordination by the three Services and other items that are carried on by the Army alone and, to my knowledge, without duplication. We make constant studies of the programs of the other services to see what advances are being made, for one reason and, for another, to make sure we are not duplicating programs unnecessarily and wasting money.

Mr. SIKES. Thank you.

What is next, General Maris?

CHEMICAL CORPS RESEARCH AND DEVELOPMENT

General MARIS. The next is the Chemical Corps, Maj. General Bullene, Chief of the Chemical Corps.

Mr. SIKES. General Bullene, the committee is glad to welcome you back. We will be glad to have your statement.

General BULLENE. Thank you, sir.

This graph may be of some assistance to you [submitting].

RESEARCH AND DEVELOPMENT RESPONSIBILITIES OF THE CHEMICAL CORPS

Gentlemen, the Chemical Corps has been assigned Department of Defense-wide responsibility for all phases of research and development in the fields of biological and chemical warfare and for certain areas of radiological warfare.

To carry out our mission under these assignments and in accordance with the guidance furnished us by the Joint Chiefs of Staff, the Research and Development Board, and by using agencies, the Chemical Corps requires $38.1 million for research and development. This amount is an increase over fiscal year 1951 ($25.8 million) and fiscal year 1952 ($31.6 million), and this is in consonance with the considerably increased emphasis directed in these fields of research and development.

In presenting details of the budget, if I may do so, I prefer to defer for a moment my presentation of 1410–Atomic, 1420–Biological, and 1430–Chemical Warfare operations because of their security classification and first cover projects 1150, 1510, 1520, 1630, and 1640 because they are unclassified.

CHEMICAL CORPS RESEARCH ON SUPPORTING EQUIPMENT FOR LAND COMBAT

The first one is project 1150 for supporting equipment for land combat. In fiscal 1951, you note, we got three-tenths of a million dollars; in fiscal 1952, the one we are now operating under, we got one-tenth, and we are asking the same amount, or another one-tenth, for 1953. This relatively small amount of funds is to continue the

development of improved flame throwers, both man-carried and vehicle-mounted. Lighter weight, increased range, and simplified construction are the improvements we seek.

CHEMICAL CORPS RESEARCH ON PERSONNEL, INTELLIGENCE, PLANNING, AND SUPPORTING RESEARCH

As to projects 1510, 1520, 1630, and 1640, which are, respectively, Personnel, Intelligence, Planning, and Supporting Research, together they amounted to eight-tenths of a million in 1951; in 1952, which we are now operating under, they amounted to $1.6 million; and we are asking the same amount, $1.6 million, for next year, 1953. Due to the relatively small dollar requirements, these have been grouped together. They cover such requirements as health hazards of military chemicals, basic research in aerosols, micro-meteorology, psychological aspects of chemical warfare operations, and supporting research in atomic, biological, and chemical warfare.

CHEMICAL CORPS RESEARCH ON ATOMIC, BIOLOGICAL, AND CHEMICAL WARFARE

Now I would like to invite your attention to projects 1410, Atomic Warfare; 1420, Biological Warfare; and 1430, Chemical Warfare.

(Discussion off the record.)

Mr. SIKES. With regard to radiological warfare, do you have the funds that are needed to carry on this project at the optimum rate?

General BULLENE. I would say we have our proportionate share of the ceiling on research that was placed on the Army.

Mr. SIKES. Then let me ask, if additional funds were allocated to atomic warfare R and D, do you feel they could be spent in a way that would show a definite gain in the rate of development?

General BULLENE. Yes, sir; I do. We have been charged by the General Staff with showing what capability can be developed.

(Off the record.)

We could do better, and do it faster, if we had more money, but I believe we will be able to meet the directive in force.

Mr. SIKES. Could you materially speed up the time at which you would actually be prepared to go into the field of radiological warfare in our defense if you had more money?

(Discussion off the record.)

General BULLENE. We would use them in more tests and, by using more people, to develop more ideas. There have been a good many ideas developed in this field. We cannot explore them all.

You might discuss this further, if you will, Colonel.

(Discussion off the record.)

LINES OF RESEARCH IN ATOMIC ENERGY COMMISSION AND IN CHEMICAL CORPS

Mr. SCRIVNER. Is not AEC carrying on experiments along the same line in research and developments?

Colonel BIRNBAUM. Yes, sir. But their problem is somewhat different from ours. They handle large amounts of material in plants which have been built to handle those things.

Mr. SCRIVNER. Do they not have a separate research and development set-up of their own in which they are spending hundreds of millions of dollars?

Colonel BIRNBAUM. Yes, sir. But they are working on a different problem.

Mr. SCRIVNER. They are working on atomic energy generally?

Colonel BIRNBAUM. Yes, sir.

Mr. SCRIVNER. And the funds here are for special military application aspects?

Colonel BIRNBAUM. Yes, sir.

(Discussion off the record.)

Mr. SIKES. If you had additional funds, would you require additional personnel in your own branch, or would you do this work through contract operations?

Colonel BIRNBAUM. We would have to do it through contract operations. We feel the only way of coming up with the final answer to the question in research and development is giving the same job to three or four competent people.

Mr. SIKES. How much money did you originally request for this activity in 1953?

Colonel BIRNBAUM. Approximately the same amount as is now in the budget.

Mr. SIKES. Do you feel that with more money now, we would be in a position in radiological warfare more quickly in the event a greater national emergency were thrust upon us?

(Discussion off the record.)

Mr. SIKES. We should like to know whether there is any duplication of work with the AEC in this field?

Colonel BIRNBAUM. We work very closely with them.

Mr. SIKES. Have you asked them to conduct some of these studies?

Colonel BIRNBAUM. The responsibility for conducting the studies for aircraft has been assigned to the Department of the Air Force and they are doing this work. They are working very closely with the AEC in connection with the propulsion of aircraft.

Mr. SCRIVNER. The statement is made so many times that, "They are working very closely," but so many times we find that it is not so.

Mr. SIKES. I should like to have a clear and comprehensive statement on the matter of justifiable additional costs; whether it would duplicate any work now being done; and whether that work may be instituted by request from any other agency.

Colonel BIRNBAUM. Very good, sir.

(The information requested was furnished for the committee files.)

CHEMICAL CORPS RESEARCH ON BIOLOGICAL WARFARE

Mr. RILEY. General Bullene, you may proceed.

General BULLENE. I have finished part of my presentation and have projects 1420 and 1430 to cover and, if it meets the approval of the committee, I shall start with 1420, unless there are questions on what has already been covered.

(Discussion off the record.)

Mr. RILEY. I notice that for this biological warfare item you are asking more than the current budget?

General BULLENE. Yes, sir.

Mr. RILEY. Would you please give us the reason for that?

General BULLENE. There are two reasons. The first is that people are paying more attention to this and taking it seriously.

The other reason is that there are new laboratories that will be coming into operation next year on a greater scale, laboratories that we have under construction at certain places.

Mr. RILEY. Does this mean an increase in personnel?

General BULLENE. It may mean some increase in personnel. We have asked for more personnel.

General MARIS. I should like to make a statement off the record, if I may?

(Off the record.)

General BULLENE. Just one other point I would like to bring out, sir. While we are requesting more, it will not mean as large an increase as it would appear on the chart, because, as you all know, expenses have gone up. There has been a raise in pay and the materials that we buy are more expensive; services are more expensive. In other words, it costs a little more to do the same things that we have been doing. At least, we are projecting it that way, since it has been the case in the last 2 years. So that all of it is not represented by added effort, but there is some added cost as well as added effort.

Mr. RILEY. Mr. Flood, have you any questions?

BACKGROUND OF THE CHIEF OF THE CHEMICAL CORPS

Mr. FLOOD. General, are you a Signal Corps officer or a Chemical Corps officer?

General BULLENE. I was originally a cavalryman and before that a naval officer. I have been in the Chemical Corps for 25 years.

Mr. FLOOD. Are you an academic chemist?

General BULLENE. No, sir.

Mr. FLOOD. Do you have a degree in chemistry?

General BULLENE. No, sir; I do not.

Mr. FLOOD. You are an administrative officer?

General BULLENE. Yes.

Mr. FLOOD. So that with reference to any technical information and knowledge that you present to us, you are actually serving as a conduit from the scientists, chemists, bacteriologists, and so forth to us; is that it?

General BULLENE. I have not presented anything very technical. I understand what I have presented. When we get into the very highly technical matters, I will have to lean on people who are Ph. D.'s but I have not gone past my own knowledge yet in this presentation.

Mr. FLOOD. That has not been difficult, because nothing has been said here that they do not talk about in the average high school.

General BULLENE. That is right.

CHEMICAL CORPS RESEARCH FINANCING

Mr. FLOOD. How much money are you asking for?

General BULLENE. The entire research and development budget is $38.1 million.

Mr. FLOOD. That includes everything from the development of the mechanical instrument and I suppose the fuel for flame throwers,

down to the bookkeeping that you do with other agencies, for what you do for them and what they do for you—in other words, transfer of funds?

General BULLENE. No, it does not include that. Anything the Navy gives us for development of an item, they will pay for. Under the original agreement in 1947, when we had this new set-up, it was agreed that the Army would finance basic research, but that the Navy and the Air Force would finance end items. In other words, if the Navy wants a new type of item they pay for that. But any basic research, we pay for.

PROPORTION OF FUNDAMENTAL TO APPLIED RESEARCH IN CHEMICAL CORPS PROGRAM

Mr. FLOOD. How much basic research do you do? What percentage of this budget for the Chemical Warfare Service is for basic research? What I am interested in, and have been in connection with this whole R. and D. presentation is to what extent do you use your money for polishing up somebody else's apple? How much basic research are you doing—approximately?

Mr. PEAKE. This year, $1,849,000.

Mr. FLOOD. Let us say $1,849,000 out of approximately $38 million will be dedicated to basic research?

Mr. PEAKE. Actually for 1953 it is $2.3 million. The first figure I gave you was for 1952.

Mr. FLOOD. Let us put it at approximately $2 million out of $40 million. You use approximately $2 million out of $40 million for basic research; is that right?

General BULLENE. Yes, sir.

Mr. FLOOD. Then you do not put much emphasis on this subject of bacteriological and chemical warfare, do you?

General BULLENE. Yes, sir; I do very much. We also think it is very urgent. We have been doing research for 10 years and we think it is time to catch up with some hardware.

(Discussion off the record.)

Mr. FLOOD. Of course you have not. Nobody has indicated anything to you except through the routine discussions in the Army budget area and the Defense budget area as to what part of this Army budget is to be devoted to bacteriological and chemical warfare research?

General BULLENE. No, sir.

(Discussion off the record.)

Mr. FLOOD. Are you satisfied with what you have?

General BULLENE. Relatively, to the whole amount; yes, sir.

(Discussion off the record.)

Mr. FLOOD. What do you include as basic research?

General BULLENE. Long-term research such as I was talking about, rather than research that ends up in an end item.

(Discussion off the record.)

Mr. RILEY. Mr. Scrivner, do you have some off-the-record questions that you want to ask?

Mr. SCRIVNER. No, thank you, Mr. Chairman.

Mr. RILEY. Now, General, if you will, complete your statement on chemical warfare.

CHEMICAL WARFARE RESEARCH

General BULLENE. Yes, sir. This will be on project 1430. We are doing more work and requesting more for this work plus the natural increase in cost as a result of the depreciation of the dollar.

(Discussion off the record.)

(The following information was requested for the record:)

Between World Wars I and II, little money was available with which to improve our position with respect to new chemical agents. Subsequent to World War II it was found that Germany had done much research during this time and had produced on a limited scale new series of agents known as nerve gases. The physiological and toxicological aspects of this new series of agents has opened a wide new field requiring extensive exploration and development. It is known that much of the German equipment and many German research men in this field are now in Russia and intelligence information is that Russia is exploiting this potential intensively.

(Discussion off the record.)

Mr. SCRIVNER. Mr. Chairman, I have an article here which I am handing to General Decker and asking that he furnish the committee with a full and complete report thereon.

TUESDAY, MARCH 4, 1952.

ARMY ENGINEERS RESEARCH AND DEVELOPMENT

Mr. RILEY. General Maris, I understand we will consider "Land combat material and techniques" this morning, for which an appropriation of $165,184,909 is requested.

Who will be the first witness?

General MARIS. Mr. Chairman, we start in to take up the Corps of Engineers' research and development programs in connection with all of these major programs, land combat being one of them. Colonel Hammond of the Office of the Chief of Engineers is prepared to present the engineer's portion of the research and development program which is divided among all of these various programs, including land combat.

GENERAL STATEMENT OF THE CHIEF, ENGINEER RESEARCH AND DEVELOPMENT DIVISION

Mr. RILEY. Colonel Hammond, do you have a statement?

Colonel HAMMOND. Yes, sir; I have a prepared statement.

Mr. RILEY. We will be glad to have you present it.

SUMMARY OF BUDGET REQUEST

Colonel HAMMOND. For the Corps of Engineers, we are requesting $21.4 million in 1953 as compared with $17 million in 1952 and $16.2 million in 1951. Major items included in this segment of the budget are R. and D. projects in the fields of mine warfare, night fighting, which includes visible and infrared, demolitions, bridging and stream crossing, airfield and road construction, liquid oxygen for guided missile fuel, and water supply. The chart shows the distribution of

1953 requirements by budget activity, and the first one is the one you mentioned, budget activity 1100, "Land combat materials and techniques."

FUNDS FOR LAND COMBAT MATERIALS AND TECHNIQUES

In fiscal 1951 we had $6.4 million; in fiscal 1952, $4.4 million; and in 1953, $6.1 million. Because of the increased emphasis on the development of equipment under this activity, the Research and Development Board has approved the allocation of an additional $1,226,000 of its reserve fund to the Corps of Engineers for fiscal year 1952, which would increase our 1952 program to about $5.7 million. This increase was largely in the field of mine warfare, with two smaller items in the bridging and stream crossing field.

PROGRESS IN LAND COMBAT MATERIALS AND TECHNIQUES

Under this activity during the past year we have made progress on several important items, including the T–5 floating and the T–8 fixed bridges for 60–ton loads, mine-warfare equipment, and infrared equipment.

The T–5 floating bridge of 60-ton capacity is a replacement of the World War II treadway bridge of 40 to 50 tons capacity. The increased capacity is necessary to carry the heavier loads we now have in the field Army. It was also very undesirable to have a treadway such as we had in the World War II bridge. The primary reason for the change was to take care of the heavier loads which could not be carried by the World War II treadway bridge. This bridge is designed for fast erection by heavy machinery, requires much less manpower to erect, and has fewer parts. It has now been placed in quantity procurement. Additional work remains to be done in fiscal year 1953 on the accessories, such as shore-to-bridge connections that will accommodate rapid changes in water level, which has not been carried to the procurement stage as has the bridge itself.

The T–8 fixed bridge, which is comparable to this, of 60-ton capacity and with a roadway width of 13 feet 6 inches, is a replacement of the World War II Bailey bridge of 50-ton capacity and 12 foot 6 inch width. For the spans normally encountered, this bridge will require less material and less time and manpower to erect. The fixed bridge will be ready for production by the end of this fiscal year.

Mr. SCRIVNER. Where are you going to use it?

Colonel HAMMOND. It will have to be used for any crossings, either wet crossings or dry crossings, where you have spans of great length—60 feet or more. They will be forward-type bridges, such as the Bailey was, that can be erected quickly and easily and transported in smaller sections to the sites where you need them. They are for the same use as the Bailey bridge. The main difference is that they are put together in large pieces. You had a number of smaller pieces in the Bailey bridge which made it easier to erect by hand but made more pieces to carry and made the problem more difficult and cost more.

Mr. RILEY. Do you have Bailey bridges on hand?

Colonel HAMMOND. Yes, sir; we have Bailey bridges on hand in considerable numbers but not sufficient to meet the requirements. The Bailey bridge will still have use in shorter spans of 30 or 40 feet.

Mr. RILEY. How many of those new bridges do you estimate you will need?

Colonel HAMMOND. I do not know. I do not have that requirement.

General DECKER. That will be discussed when the Procurement and Production appropriation is presented. This concerns the development of the bridge. The quantities to be purchased will be discussed later on in the procurement program.

(Discussion off the record.)

FINANCING PROTOTYPES

Mr. RILEY. General, I trust the prototypes you are using in these experiments are furnished and paid for out of appropriations that are here listed and are not furnished by any other division of the Army or paid for out of other appropriations.

General MARIS. Yes, sir.

Mr. SCRIVNER. In other words, that is the development end of R. and D.?

General MARIS. Yes, sir; and that is why we talk about new hardware on these developments resulting in more expense. That is the reason for it—the actual development of the end items. The research, you might say, is relatively inexpensive, but, when it comes to producing the end results from the research, then the cost goes up. That is why when we get into this development phase in large measure, increased funds are necessary for the end items such as we have been discussing.

Mr. RILEY. I am interested in knowing, since the appropriation is up from $4.5 million to something over $6 million, an increase of over $1.5 million over last year. Is that because some of these prototypes are more expensive than others, or because it takes additional manpower to test them?

General MARIS. It is just coming into the hardware phase of the development, which is resulting in a large amount of the increased cost.

Mr. RILEY. Do you have more personnel working on it than you had last year?

General MARIS. Some; yes, sir.

Mr. RILEY. But the main expense is in the end items?

General MARIS. Yes, sir.

COMPLETENESS OF DISCLOSURE IN BUDGET PRESENTATION

Colonel HAMMOND. As a matter of fact, as I pointed out, we have had to increase this program in 1952 to a total of $5.7 million; so the increase actually is from $5.7 million to $6.1 million. The additional funds were made available for this current fiscal year.

Mr. SCRIVNER. Why did not you say that in your presentation? Why in your presentation did not you say that in fiscal 1952, plus the supplemental, you had that amount?

General MARIS. We had no supplementals in 1952; they were in 1951. In 1952 we are getting some money from the Research and Development Board, from the Secretary of Defense's reserve fund. We have gotten very little so far.

Mr. SCRIVNER. Where do you get the other $1.3 million?

General MARIS. That has not been received yet; actually we have not gotten it yet. We are in the process of getting it.

Mr. SCRIVNER. All I am going by is the statement just made by the Colonel that there was a step-up from $5.7 million to $6 million, although his presentation showed that in fiscal 1952 you got $4.4 million.

Colonel HAMMOND. The actual situation is, as stated in my statement for the record, that the Research and Development Board approved an allocation, but the funds have not finally been made available by RDB.

Mr. RILEY. But you expect to spend $5.7 million this year?

Colonel HAMMOND. Yes, sir.

Mr. RILEY. As against $6.1 million in fiscal 1953?

Colonel HAMMOND. Yes, sir.

Mr. RILEY. But you have not actually gotten the money?

Colonel HAMMOND. We have not actually gotten the money.

Mr. RILEY. Proceed.

ENGINEER RESEARCH PLANS FOR FISCAL YEAR 1953 UNDER ACTIVITY 1100

Colonel HAMMOND. The fiscal year 1953 program includes research on new means for mine detection and development of detectors which will be more reliable and less complex than the present electronic detectors. Improvements in performance of present detectors will be sought to increase their capability of detecting mines at greater depths and make them less expensive, more rugged, and more easily maintained. Methods will be explored to provide better mine-clearance equipment incorporating means of clearing mines of new types now in development.

(Discussion off the record.)

AIR DEFENSE MATÉRIEL AND TECHNIQUES

Under budget activity 1200, "Air Defense matériel and techniques," fiscal year 1951 was $0.3 million; fiscal year 1952, $0.2 million; and fiscal year 1953, $0.3 million. This relatively small activity covers research and development on items of infrared search, detection, and tracking, protection of personnel and matériel from air attack, and ground deception and concealment required for air defense operations.

Mr. RILEY. How do you detect personnel?

Colonel HAMMOND. The detection of personnel is largely from observation.

(Discussion off the record.)

AIRBORNE LANDING, AMPHIBIOUS OPERATIONS, AND SUPPLY AND MAINTENANCE OPERATIONS

Colonel HAMMOND. Under budget activity 1300, "Airborne landing," amphibious operations, and supply and maintenance operations," fiscal year 1951 was $3.4 million; fiscal year 1952, $3.9 million; and fiscal year 1953, $4.5 million.

ACCOMPLISHMENTS UNDER ACTIVITY 1300

Accomplishments during the past year under this activity include development of a small liquid oxygen plant for guided missiles, high

capacity water distillation equipment, landing mats for heavier aircraft, and airborne construction equipment.

Liquid oxygen-liquid nitrogen generators of 5 to 6 tons a day have been developed for field use in support of the guided missile program. Work on a larger but still mobile unit of 20 tons a day capacity progressed to the point of assembly of components in a complete trailer mounted unit for field test.

(Discussion off the record.)

Colonel HAMMOND. A sea-water distillation unit of 1,250 gallons per hour capacity has completed extensive tests under actual use conditions at an Air Force base in Bermuda. This is the largest unit ever made for military use and has stimulated commercial production of large units. As a result of this development, which includes a new feature greatly reducing scale deposit in the tubes, equipment of much greater capacity, efficiency, and life has been obtained.

Mr. SCRIVNER. Right on that point, if this has been developed to a point of commercial production, is it not one phase of activity that you can kind of taper off on, now that you have commercial production interested?

Colonel HAMMOND. On this particular size; yes, sir. As a matter of fact, in this sort of development it is always done hand in hand with industry rather than going out and developing something ourselves, for the obvious reason that when we get through developing it we want something that can be produced and not something that is a particular piece of military equipment. On this particular size unit, we want to go on and put those improvements on other sizes of smaller units which are mobile and go with some of our field troops. Secondly, in producing a type that has never been used before, that resulted from the military development program, we used to have to shut down the equipment to get the chemical deposits out of the tubes. We used to have to shut down the equipment every 200 or 300 hours to get out the deposits. There have now been tests in the large size units which show they will run for 3,000 or 4,000 hours without shutting down the equipment. As a further advantage, by that kind of operation we think it may be possible to use less critical materials in the evaporators and tubes than we have had to use before, and so, instead of using high alloy cadmium steels, we will use aluminum, which is still a critical material but is less critical than high alloy steels.

Mr. RILEY. Do I understand from this that you distill sea water and remove all the ingredients that are harmful?

Colonel HAMMOND. Yes, sir. The primary purpose is to get palatable, potable water for drinking and cooking purposes and in even the process which is used the mineral salts that are in sea water have always been a big problem. You can evaporate the water and get rid of so much of the salt deposit that you scarcely clog up the machinery. We have improved that greatly, so that we can run the equipment for a much longer period of time before we get the clogging effect.

Mr. RILEY. Can the distilled water be used in boilers and things of that kind?

Colonel HAMMOND. It could.

Mr. NEW. It is coming out now with about 50 parts per million of salt content, which is very pure water. And the output has increased from something like 15 pounds of distilled water per pound of fuel,

starting at the beginning of World War II, to where we have about 250 to 300 pounds of distilled water per pound of fuel now through this new process, which is quite a remarkable increase.

Mr. RILEY. It has wonderful possibilities. Like Mr. Scrivner, I am just wondering if the commercial people won't take this process on now and use it, so that we can leave that part of the research out.

Colonel HAMMOND. We always have that problem on things that have commercial application, that you have certain requirements in the military which may be present in the commercial field but which are not quite as pressing, and therefore they do not get accomplished unless they get the impetus from the military. This sort of improvement, which could have been done by commercial firms, was, as a matter of fact, done by commercial distillation equipment people, but it was not done on their own; it took the prod and push from us.

Mr. RILEY. Proceed.

Colonel HAMMOND. Also included under this program are the airfield surfacing programs. An improved landing mat of 37,000 pound wheel-load capacity was put into production at the beginning of fiscal year 1951. Steel mats of 80,000 pounds wheel-load capacity, which are required for present day medium aircraft, are now under test and have been released for procurement even before completion of tests.

The landing mat carries a certain amount of load, but you must still have a good supporting surface to be able to have the airfield surface stand up. The big problem in a place like Korea is, if you do not have that, you get into excessive maintenance problems. The Air Force has adopted this M–8 landing mat and also the M–9, which is the same thing in aluminum.

(Discussion off the record.)

Colonel HAMMOND. This membrane material costs about 10 cents a square foot compared to 55 or 60 cents per square foot for the steel mat. That is the direction in which the problems are going. This is the sort of thing you never get finished on, because you get an airfield surface that will take care of airplanes, and then there develop aircraft changes and you get completely different requirements.

Also included in this activity is a newly developed airborne construction crawler tractor bulldozer weighing 16,000 pounds. This is now in quantity procurement. The picture on the left [indicating] shows a crawler tractor being dropped from an airplane; the picture on the right shows the tractor dropping. This new item with eight times increase in capacity costs $8,000 as compared to the World War II airborne bulldozer cost of $3,600.

(Discussion off the record.)

FISCAL YEAR 1953 RESEARCH PLANS UNDER ACTIVITY 1300

Colonel HAMMOND. The program for fiscal 1953 includes improvement in the capacity and mobility of liquid-oxygen equipment and the development of distribution equipment for transport from the generator to launching sites of missiles. Development of equipment and techniques for guided missile rocket fuel fire protection will be undertaken.

Development will continue on landing surfaces, including the membrane type for emergency use on fighter fields where wheel loads are

lower. This membrane may eliminate the requirement for metal mats in many cases, meaning a saving on steel. It is expected that this material will be in service test early in fiscal year 1953 and may reach procurement stage by the end of the fiscal year. Production capacity appears to be readily available.

Current programs with industry to provide greater interchangeability between commercial models of attachments for cranes, shovels, and tractors are to be continued.

Intensive development of simple means of providing line-of-communication or nontactical bridging likewise will be continued. Bridges of required capacity and for rapid field assembly are under development, and the launching equipment and erection methods will be developed.

MILITARY USE OF CIVILIAN MODELS OF EQUIPMENT

Mr. SCRIVNER. There has always been a rather serious picture presented in many of these things where it has looked as though the military has gone out of its way to make some particular change that makes it impossible to use some of these pieces of equipment that are commercially made. This progress is interesting and important, but, of course, the big question arises in the minds of all of us who have watched it at all of how much progress have you made, which calls for sometime getting to the point where you can make more use of commercial models without having so many different requirements for military use.

I ask that question because a great many of the men who were in the engineer service during World War II were, in their own right as civilians, quite competent contractors, and almost without exception they have pointed out the fact that many military requirements were without reason and in a very large proportion of the cases commercial models could be used; in fact, they had themselves used commercial models in work almost identical in character with what they were doing, during their period of service, with what is known as the military type.

Colonel HAMMOND. In that connection, the problem here is actually one in reverse. We use commercial equipment. We need particular technical changes. There are some things which are troublesome to industry but which are necessary from the military standpoint. They do not affect their production capacity particularly.

One is radio suppression on engines. The problem we are attacking is one that is well recognized by industry and comes about from the use of commercial equipment. But you get into the problem there of the use of commercial equipment, because each one of them for competitive reasons uses a slightly different arrangement, or they may be convinced that from a technical point of view, it is better. For instance, take two different types of cranes, both with the same capacity. Each will have a different method of attaching the boom to the crane. Both do the same job, but you cannot buy two cranes and one crane boom and one shovel front and use one as a shovel and use the other as a crane and have them interchangeable. You have a shovel front and boom for each one of those, because you cannot interchange those things.

The only possible way to solve that would be to come up with a military design of a crane where they would all be exactly the same. We do not consider that desirable, nor does industry from a production standpoint, because we would have something that nobody makes and would have a hard time getting parts. The only way the equipment could be interchanged is to buy all of the cranes from one manufacturer, and then all of the parts would be the same. There are two reasons why we cannot do that. One is that we get into procurement difficulties with the other people who are excluded; but more important, it takes the entire productive capacity of the industry to supply the requirements when you get into mobilization, which leads to the third thing of trying to get the maximum amount of interchange between components and attachments from the manufacturers themselves, and an approach is being made on that.

The same thing has been done over a longer period of time on engines that is being done now in this field of cranes, shovels, and tractors, to see what changes they can make in their own pieces of equipment so that you have the maximum interchange. There are 25 or more different types of cranes. It may not be possible to reduce those to one design of crane boom and method of attachment, but if you can reduce from 25 to 3, 4, or 5, you have improved the situation immeasurably.

Mr. SCRIVNER. And that is what this program is designed to do?

Colonel HAMMOND. That is what this program is designed to do; yes, sir. In a few minutes I will discuss a similar approach that has been used on industrial engine equipment, and that has progressed to a much greater degree to the point where we are going to adopt it.

RADIO SUPPRESSION ON MOTORS

Mr. SCRIVNER. You made mention of radio suppression on motors, particularly. Are you doing that on all motors or just those that will be in the critical area?

Colonel HAMMOND. That is a problem that is being studied now. The requirements in general are for all motors, but that is being restudied.

Mr. SCRIVNER. That adds a pretty large share to the cost; does it not?

Colonel HAMMOND. Yes, sir. It is not very large percentagewise, but when it is spread over a large number of engines it mounts up. That, of course, is not an engineer requirement but is a problem that is being put on us. The main thing that bothers industry on that is not so much that it is a requirement as the fact that the Army and Navy have had slightly different requirements. We are trying to resolve all of them to where at least everybody would ask for the same thing, and that would ease their problem considerably.

Mr. SCRIVNER. If it is not an engineer problem, why is it being put on you?

Colonel HAMMOND. It is a Defense Department-wide problem, actually, and is now being worked on by the Munitions Board to come up with a standard practice so that we all ask for the same thing.

Mr. SCRIVNER. If you can get that done, it will simplify matters a great deal and probably reduce a great deal of the Government ex-

penditure in this field, like in some others where it is apparent that the Munitions Board has not done what it is supposed to do for some reason or other. Of course, if that is their decision, I cannot put any blame upon you.

(Discussion off the record.)

ENGINEER ATOMIC, BIOLOGICAL, AND CHEMICAL WARFARE ACTIVITIES

Colonel HAMMOND. The next budget activity is 1400, "Atomic, biological, and chemical warfare."

The requirement for fiscal year 1951 is $0.1 million; for fiscal year 1952, $0.2 million; for fiscal year 1953, $0.2 million.

The small amount required by the Corps of Engineers under this activity is for development of engineer matériel and techniques required for defense against atomic warfare, and the development of infrared detection items necessary against chemical warfare.

ENGINEER PERSONNEL, INTELLIGENCE, AND PLANNING OPERATIONS

Budget activity 1500, "Personnel, intelligence, and planning operations" for fiscal year 1951 is $2.3 million; for fiscal year 1952, $2.7 million; for fiscal year 1953, $2.8 million.

This activity provides for research and development on water-supply methods and equipment, and insect and rodent control, for which we have Army-wide responsibility, items of mapping and geodesy, earth sciences, and cover and deception.

An example of the equipment under this is a water-supply item. One of the problems in connection with that was the large amount of area required to set up the equipment and the time to set up the equipment, which was supposed to be mobile. That was acceptable in warm climates, but in below-freezing weather—not necessarily Arctic—in other cold regions, you had a great deal of difficulty in providing shelter for the water-supply equipment.

As a result of a development in this field, we have a water-treatment unit now that requires 25 square feet as compared with 430 square feet that we used to have, which means that you can provide heat for your equipment now where you could not do it very practically before.

The main change in this is that you have a continuous-flow treatment of the water, whereas before we had to have sedimentation tanks to allow the treatment to become effective. So, we have replaced by one truck-mounted piece of equipment what we used to put up in 430 square feet, and still require the truck to carry it around.

ENGINEER SUPPORTING RESEARCH AND OTHER OPERATIONS

Budget activity 1600, "Supporting research and other operations," for fiscal year 1951 is $3.6 million; for fiscal year 1952 is $5.6 million; for fiscal year 1953, $7.5 million.

Under this activity we are developing many items that will be used throughout the Army, including items in the major fields of infrared, industrial engines, snow, ice, and frozen-ground research, and electric-light-and-power equipment.

Mr. SCRIVNER. What causes the increase of nearly $2 million in this item, an increase of about 40 percent?

Colonel HAMMOND. There are two major programs which will be emphasized in this. One is the snow, ice, and frozen-ground research, for which we have the Department of Defense responsibility.

Mr. SCRIVNER. That is a program that we have been appropriating money for in research and development for as long as I can remember, and the problem seems still to be here. Are we getting anyplace with it?

Colonel HAMMOND. We think we are; yes, sir. The problem will be with us for a good long time. As we see that problem, it is in about the same state now that soil mechanics was 30 years ago. There is not much that we know about it, except that there are a number of problems. Here you have a somewhat similar situation, but here we do not even have the basic information on the properties of snow and ice. What are they? They are not even known.

This was important, because this is being done for the entire Defense Establishment and not just for the Corps of Engineers, because equipment that we are going to use in those areas is now being developed and designed on empirical methods, the cut-and-try method, based on what we know now, which is not very much. It is almost like designing a steel structure without knowing what are the basic properties of steel.

Mr. SCRIVNER. Your statement disturbs me somewhat, in that there have been people living under these conditions ever since the beginning of time; some of them fairly advanced nations who have had to combat these problems throughout all the centuries. Certainly there should be some answers here.

Colonel HAMMOND. There is a great deal of experience, but most of it is not on a very scientific basis, and it is partly a question of scale and what you have to do. It is possible for small units to get along in Arctic areas where a larger unit, which has a fighting mission, would have a great deal more difficulty.

Another thing I should like to call your attention to, and it is the biggest cause of the increase in this program, and that is in the infrared field, and primarily in that part of the infrared that we were hearing about earlier, of the passive type of equipment. The Corps of Engineers is responsible for the development of components and of some equipment in this field.

I would like to go off the record at this point, if I may.

(Off the record.)

INDUSTRIAL ENGINES

Mr. SCRIVNER. Suppose you tell us now about your program on industrial engines?

Colonel HAMMOND. The engine program has been conducted in exactly the same manner as we are doing with cranes, shovels and tractors. This program has been continuing for a longer period of time.

An industry committee was set up, and the approach was to give them the problem—not to tell them what was the solution we were looking for but to give them the problem and say, "We have just got an impossible situation here from the procurement and maintenance standpoint. We have to buy spare parts for each of your different types of equipment; and, even though we may have enough

engines and enough spare parts on hand in any given field installation, we may have a different set of spare parts than the engines that are deadlined, which happened frequently in the last war."

They worked with the problem and did not come up with too much until Korea came along, when they got quite active and settled on the solution which we are about to adopt.

This program, again, has been ostensibly at least a Munitions Board program, which has been conducted directly by the Corps of Engineers. But it has not been a program just for the Corps of Engineers or just for the Army. It has always intended to be a Defense Department program.

A meeting was held on the 20th of February in Chicago at which all engine manufacturers or industrial-engine manufacturers and spare-parts manufacturers were invited to be present, at which time the announcement was made that, as a result of the development so far in this program, the Defense Department intended to procure in 1953 engines for that part of the program which has been done so far on this new basis.

The basis was as shown on this chart here.

On the left [indicating] you have production engines, and in the particular range we are talking about, bore sizes of 2⅞ inches through 4⅛ inches. There were 138 different commercial engines, all of which used slightly different parts. The valves would be of different dimensions slightly; the pistons would be of slightly different dimensions, and so forth, even though they were made for about the same horsepower range or were intended to do the same thing.

The same considerations obtained here. You could have a military-designed engine or you could say simply that we would buy from only one manufacturer. But, for the same reasons, that was not considered practical.

So this solution—which was actually first proposed by Mr. Crawford, who was vice president in charge of engineering for General Motors, and a member of this committee—was to try to come up with a standardized set of parts which each manufacturer could use by slightly modifying his commercial design of engine. As a result of that, where before we had 1,187 different sizes and dimensions and types of parts, we will now have 59 different sizes and types of parts on the production list.

That will mean then that an engine manufactured by, let us say Ford, will still not be identical with the engine of General Motors, but it will mean that both Ford and General Motors will pick the parts that they use in their engine from this list of 59 instead of from a list of 1,187.

So that from the standpoint of stockage and procurement you will stock 59 different parts instead of 1,187. You will not, of course, get the same degree of reduction in procurement, because you will have to buy more of each of these 59 than you did of each of these 1,187 [indicating chart] but not proportionately more.

So far, the program has progressed to the point where we have actually tested out this concept in a number of different commercial engines. People have modified their engines, given them exhaustive tests, and in no case to date—although the tests are not all completed—has any engine proved to be handicapped by the use of these

parts. But a couple of them have immediately shown improved performance by reason, perhaps not so much from the use of standardized parts as from the types of standardized parts—hard-faced valves and valve rotators, and that sort of thing.

So that this program, in this range of 2⅞ inches to 4½ inches bore size will be adopted by the Defense Department this year. Further work remains to be done in this field to take in the additional bore sizes of 4 inches through 6 inches and to extend this program to the accessories.

So far the program has been limited to the so-called high-mortality parts, the moving parts that wear out more quickly. But you have a similar problem with things like generators and fan belts and water pumps and fuel pumps and that sort of thing.

The program is to be extended to cover the additional bore ranges and this is again just in the gasoline engine, but to extend it to the additional bore ranges to cover the accessories and to start a study of the same kind on Diesel engines.

Mr. NEW. There is one other point that I think would be of interest to the committee. The time-consuming part of this task was finding out what the limits were of existing tooling for making these high-mortality components. The whole concept was based on arriving at standard parts that could be made within the limits of existing tooling, so that you would not have a retooling job such as you would have if you adopted a straight military design of engine.

That took a lot of work, getting the data from the manufacturers and arriving at the permissible tolerances within which you could work. That was a time-consuming problem.

We are now getting into the actual buying and proof-testing of engines. But the project is aimed at no major retooling.

Colonel HAMMOND. Mr. Chairman, that concludes my statement, unless the committee would like to see any more of this equipment, the infra-red equipment, or any actual demonstrations.

Mr. RILEY. Has there been a corresponding study to standardize the sizes of tires so that there will not be so many sizes?

Colonel HAMMOND. Within the military there is such a program; yes, sir.

Mr. RILEY. How many sizes do you use now?

Mr. NEW. I have seen the figures, but I do not recall them. Ordnance reecently gave out a statement on that, but I do not recall the figures.

Mr. RILEY. It is amazing to me how many different sizes of tires the ordinary supplier has to stock in order to take care of civilian requirements. It would seem to me there would be a corresponding problem in the military, where you would have to have much larger stocks should you have to have so many different sizes.

Colonel HAMMOND. An interesting thing in this connection is that this is becoming a commercial problem as well because such agencies as the Society of Automotive Engineers have various committees set up, aside from those considering the military problem, trying to standardize on some of their attachments, their tire sizes, and that sort of thing, so that we will not have so many different ones.

Mr. NEW. Such things as hubs and wheels and ignition systems, and so forth. They are working on those now.

INCREASE IN PERSONNEL

Mr. RILEY. General, on this program, how much has your personnel cost increased?

Colonel DUDLEY. For engineers only?

Mr. RILEY. Just for this program, for the years 1951, 1952, and 1953, as you have given it for these other items.

Colonel DUDLEY. For the engineers, the 1953 figure for salaries is $8,040,000. For 1952 it was $8,364,000. There is a slight decrease in actual dollars for personnel salaries.

Mr. RILEY. A decrease for 1953 from 1952?

Colonel DUDLEY. Yes, sir.

Mr. RILEY. That is gratifying.

Mr. SCRIVNER. The decrease part of it is gratifying but the "slight" is not.

Mr. RILEY. Gentlemen, thank you very much.

MEDICAL SERVICE RESEARCH AND DEVELOPMENT

Mr. RILEY. At this time we shall take up the Medical Service. General Maris, will you present your witnesses?

General MARIS. Mr. Chairman, for the Medical Service, Col. Frederick J. Knoblauch, Deputy Chairman of the Medical Research and Development Board, will make a statement.

Mr. RILEY. We are very glad to have you here, Colonel, and will be pleased to hear your statement.

GENERAL STATEMENT OF THE DEPUTY CHAIRMAN OF THE RESEARCH AND DEVELOPMENT BOARD

Colonel KNOBLAUCH. Mr. Chairman and members of the committee, the Army Medical Service research and development program will require $11.7 million in 1953 as compared with $10.1 million in 1952, and $6.9 million in 1951. The program has as its primary aim the maintenance of the health and welfare of our troops in order to conserve fighting manpower in all of the extreme conditions imposed by war. It must take into account the global nature of modern warfare in all climates from tropical to arctic. It must recognize that the primitive conditions of combat present hazards to health and welfare not usually encountered in the relatively safe and sanitary environment in which we normally live. It must also take into account the severe stresses both mental and physical to which fighting men are exposed, as well as his human limitations in operating the complex machines of modern war. The threat of atomic, biological, and chemical warfare further complicates the problem.

The bulk of the increase for fiscal year 1953 is concentrated in the areas of atomic warfare and personnel operations and will permit continued research at an increased tempo in these vitally important fields.

Gentlemen, if you will turn to page 5 in your budget book classified section you will find the first section of the Medical Service Research and Development budget. The project on atomic warfare for the Medical Service amounted to $1.5 million in 1951, $2.1 million in 1952, and $2.6 million in 1953.

Considerable progress has been made to date in the treatment of wounds and burns arising from combat operations, as well as those

likely to occur in catastrophes involving mass casualties, such as an atomic attack.

Prominent among recent developments in this field are improved methods of treating burns involving large areas of the body, and the development of Dextran as a substitute for plasma in an emergency.

In fiscal year 1953 an intensive effort will be made to sterilize whole blood and to prolong its storage life. Whole blood is still the best substance known to combat the shock associated with extensive wounds and burns. We must also improve our methods of sterilizing plasma to lessen the danger of transmission of the virus of serum jaundice.

Methods will be sought to protect against, or lessen, the damaging effects of atomic rediation. The effects of partial body shielding, drugs, bone marrow, and platelet injections will be thoroughly investigated.

On page 42 of your budget book is shown the Medical Service budget requirements for personnel operations: For fiscal year 1951, $5.3 million; fiscal year 1952, $7.6 million; and for fiscal year 1953, $8.5 million.

A number of diseases which are rare in the United States occur in the Far East, where we are now fighting, and in other areas where we may be required to fight. The Army must conduct research work on their prevention and cure. For example, research performed by the Medical Service on Japanese B encephalitis in 1951 resulted in the identification of a particular mosquito as the germ carrier. This knowledge makes possible more effective control of this disease. A new disease began to occur in our troops in Korea last year. It is known as Songo fever and is believed to be a virus disease which has moved down from Manchuria. The mortality in this disease is about 8 percent. In order to intensify our efforts to control this disease, we have organized a team of experts who will leave very soon for Japan and Korea.

Important advances have also been made in the treatment of dysentery and amebiasis using the newer antibiotics. The incidence of cold injuries is considerably less this winter, as a result of the efforts of a cold injury research team, now in Japan and Korea. The results of their clinical studies will be of great assistance in future cold-weather operations.

The studies conducted by the Medical Service in conjunction with the Quartermaster, Ordnance Corps, and Navy on the types of wounds which were being caused by shell, grenade, and mortar fragments, indicated that suitable body armor would prevent, or lessen, the severity of many of these wounds. This was an important contribution and indicated that it was a practical means of reducing front-line casualties. These studies are continuing, and recent press releases from the Far East have already indicated that lives are being saved.

A new drug, primaquine, has just been developed and tested by the Medical Service. It is the first curative drug which has been found for the type of malaria most commonly encountered by our troops. We are also studying a new drug which would be suitable to suppress malaria in large populations, in areas where it may become necessary to send troops. Studies are also being conducted on better vaccines for influenza and typhoid fever, substitutes for codene in the event that our supply of opium should be cut off, and on methods

of feeding with intravenous fats to meet the high caloric diet required by a wounded soldier, who may be unable to take in enough by mouth.

Extensive research in the past year on manual methods of artificial respiration resulted in the recommendation that the commonly used Schafer method be discarded in favor of the more effective back pressure arm-lift method. This method has been accepted nationally and is now being taught by all rescue agencies.

As indicated on the chart, small amounts are also included under projects 1630 and 1640 for basic and supporting research in the medical field.

Mr. RILEY. Colonel, you request an increase of around $1.5 million. If I understand your statement correctly, most of that is for increased personnel, is that right?

Colonel KNOBLAUCH. Six hundred thousand dollars is the increase in personnel costs.

Mr. RILEY. And the other $900,000 increase would come from what?

Colonel KNOBLAUCH. Increased amounts for equipment, specialized equipment; intensifying our efforts in certain areas, increasing our efforts particularly in the field of blood.

BLOOD RESEARCH

It is quite common knowledge—and we know it from radio publicity—that we do not ever seem to have quite enough. So we are increasing our efforts to prolong the life of blood.

At the present time we can keep whole blood only 21 days. Some very recent work, which we are also investigating, started in England, which showed that there is some possibility of freezing blood under special conditions so that it could be kept for considerably longer periods. There have been some indications that might be done up to as long as 90 days.

If that is true, we would certainly improve the blood situation a great deal. The difficulty in sterilizing blood and plasma is a very real one and we have got to find better methods to do that.

The danger of the transmission of serum jaundice is known and we are attempting as rapidly as possible to solve that problem.

Mr. SCRIVNER. What is serum jaundice?

Colonel KNOBLAUCH. It is caused by one of two viruses. It is associated with infectious hepatitis, which was a serious problem in the last war.

Mr. SCRIVNER. What is hepatitis?

Colonel KNOBLAUCH. It is a virus disease transmitted by finger-to-mouth, which was very common in World War II.

General MARIS. What is its effect?

Colonel KNOBLAUCH. It affects the liver. It is a virus disease causing prolonged hospitalization. During the war the time was around 90 days. We have got the time down to about 55 days by improving methods of diet and hospital care, controlling ambulation; so that we do not get them out of bed too soon. It has been a very serious problem causing a great loss of man-days.

Serum homologous jaundice also affects the liver. Clinically they are identical. The incubation period is longer and the danger of it is increased by multiple vaccinations.

Mr. FLOOD. Is it a virus indigenous to blood plasma, or is it isolated in man and shows up in the plasma?

Colonel KNOBLAUCH. That is true, sir.

Mr. FLOOD. Which is true—which is it?

Colonel KNOBLAUCH. It is a disease of man. The virus is found in the blood and when we draw blood for transfusions, it is in the blood. It is found in a certain percentage of people. The incidence in this country, as best we know it, is about 0.3 percent. That is when whole blood transfusions are given.

When blood is made into plasma it is necessary to pool it. Quite obviously, we could not separate single batches of plasma from blood and keep them separate. You have to pool them in order to get sufficient amounts of plasma.

After blood has exceeded its period of usability of 21 days, then we may make plasma out of it. We separate the red cells and use just the plasma.

Mr. FLOOD. Is this a disease peculiar to the North American peoples, or is it universal?

Colonel KNOBLAUCH. No, sir; it is found all over the world.

Mr. FLOOD. Any blood will produce the same condition?

Colonel KNOBLAUCH. Yes, sir; it may be found anywhere in the world.

Mr. FLOOD. What are you doing with our friends on the other side, the British and the French? Do you handle this all yourself or are you cooperating with them or are they cooperating with you in this whole area?

Colonel KNOBLAUCH. We are all cooperating.

Mr. FLOOD. Actually?

Colonel KNOBLAUCH. Yes, sir. They are conducting research on this, too.

SUBSTITUTES FOR BLOOD PLASMA

Mr. FLOOD. To what extent is it possible now, and to what extent do you think it will be possible in the future, and what attention are you giving in your basic research, to the matter of a substitution, to a greater degree than is now practicable, of artificials for blood plasma?

Colonel KNOBLAUCH. We have quite an extensive program on that. We have developed an American form of dextran. We are investigating a number of different kinds of gelatins; in fact, three at this time.

We have tested the Swedish form of dextran and the German form of PVP, which is a plastic.

These substances which were developed in Europe have certain disadvantages which we feel are sufficiently great to warrant our not using them until they are further investigated and shown to be entirely safe. We got reactions to the Swedish form of dextran and we are not at all sure that the use of the German form of plastic plasma expander would be good. There is a question as to what happens after it is put in. That is, do you ever get rid of it; does the body get rid of it? It has to do with the molecular sizes of the material injected.

Mr. FLOOD. What are the raw materials that are involved?

Colonel KNOBLAUCH. They are made from different things. Dextran is a form of product which results from the action of a certain bacteria on a sugar solution. That particular one which was developed first by the Swedes seemed to offer the greatest promise. However, we got a considerable number of reactions to it, which were not very good.

Mr. FLOOD. Are you using anything besides dextran? What are you using that is your own development?

Colonel KNOBLAUCH. Dextran has been the one which has been recommended for adoption for stockpiling for emergency use.

Mr. FLOOD. Who first thought up dextran?

Colonel KNOBLAUCH. The Swedes first developed it and we have improved upon the product in this country.

Mr. FLOOD. You polished their apple, did you?

Colonel KNOBLAUCH. Yes, sir.

Mr. FLOOD. Do you have anything which you originated?

Colonel KNOBLAUCH. This American dextran is the improved product.

Mr. FLOOD. You have improved the Swedish dextran?

Colonel KNOBLAUCH. Yes, sir.

Mr. FLOOD. You have developed nothing analogous, in the same family, that is just as good?

Colonel KNOBLAUCH. Not of that particular type.

Mr. FLOOD. Does anybody else have anything like that?

Colonel KNOBLAUCH. No, sir.

Mr. FLOOD. Everyone is concentrating on this?

Colonel KNOBLAUCH. Yes, sir.

Mr. FLOOD. What did the Germans use?

Colonel KNOBLAUCH. The Germans used a plastic which we are quite afraid of, because we do not know what happens to this material. We have tried to find out from searching the material available in Europe, records, pathological reports, records of people who had died, and others. I understand there were many units of this given to the Germans. But we do not intend to inject any material into anyone when we do not know what happens to it.

LOSS OF WHOLE BLOOD THROUGH SPOILAGE

Mr. RILEY. Colonel, what proportion of the blood is lost through your not being able to preserve it long enough?

Colonel KNOBLAUCH. After 21 days it must be discarded and we use the plasma then.

Colonel WOOD. It is under 10 percent.

Mr. RILEY. These experiments that you are making would tend to decrease the loss by how much?

Colonel WOOD. It is a tight schedule to draw blood, especially on the east coast here, and then ship it and have it finally used in Korea within a 21-day period. You can recognize the difficulties.

Most of the blood which arrives in Korea is of the order of 10 days or 2 weeks old already, which means that it has to be used promptly or we will have to either discard it or convert it to plasma or into something else to use it.

If we can stretch that period by even a week, or 2 weeks, it would be a tremendous advantage. That is what is being attempted now.

DEVELOPMENT OF PRIMAQUINE

Mr. FLOOD. Whose drug is primaquine? Who found that one?

Colonel KNOBLAUCH. The Army Medical Service developed that, sir. It was synthesized by Dr. Elderfield of Columbia University for us.

Mr. FLOOD. How long has it been operational?

Colonel KNOBLAUCH. It was standardized within the last 2 or 3 months.

Colonel WOOD. Mid-December.

Colonel KNOBLAUCH. December.

INCIDENCE OF MALARIA

Mr. FLOOD. What is the incidence of any category of malaria from the Korean theater?

Colonel WOOD. About 20 percent.

Colonel KNOBLAUCH. Returnees.

Mr. FLOOD. How does that compare with the incidence in the Italian campaign, approximately?

Colonel WOOD. I think it is a bit higher than in the Italian campaign.

Mr. FLOOD. How about some of the Central Pacific areas? I do not mean the South Pacific.

Colonel WOOD. It is not as bad as that. It is not as high and the strain is not as vicious as that South Pacific strain.

Mr. FLOOD. What are your experiences with the recurrence of Korean theater malaria? Have you had a chance yet to find out much about it?

Colonel WOOD. We have had some indications of it, sir, but by next October we will know the whole story.

Mr. FLOOD. You have not yet had sufficient time; is that it?

Colonel WOOD. Not quite; no, sir.

Mr. FLOOD. Are you getting more than you expected from the Pacific and the Italian malaria?

Colonel WOOD. I think about what we expected. We expected something of the order of 20 to 30 percent when they ceased taking their suppressive drug.

Bear in mind, we have had no malaria of any consequence in the theater as long as they take chloroquine. It is only when they leave the theater and stop taking the suppressive drug that they come down with the malaria.

POSSIBILITY OF MALARIA TRANSMISSION IN UNITED STATES

Mr. FLOOD. What is the danger of infection of the civilian population of this country from the recurrence of malaria infections acquired by the troops overseas?

Colonel WOOD. We have talked that over repeatedly with the Public Health Service. We feel and they feel that it is rather small. We have about 200,000 Mexicans and Puerto Ricans who used to come into this country from malarious areas each year and in general, they do not establish a focus of malaria.

Mr. FLOOD. Do you know of any cases where the families—wives, children, relatives—of overseas veterans have actually been infected by malaria of any category, from any theater of war?

Colonel WOOD. There have been only a few civilians; I think only about two or three authentic cases where there has been any transmission in this country.

Mr. FLOOD. Is this primaquine an oral drug?

Colonel WOOD. Yes, sir.

Mr. FLOOD. Was it supplied in the theaters?

Colonel WOOD. No, sir. It was given by the Medical Service en route back from Korea, who were returning by boat. Returnees are now given this.

MALARIA TREATMENT FOR PERSONNEL RETURNED TO UNITED STATES

Mr. FLOOD. Do you mean that everybody who leaves the theater must take this?

Colonel WOOD. If they return by sea; yes, sir. We would like to give it to those who return by air, but they are not around long enough. We have a 14-day course of treatment. They take one tablet per day.

Mr. FLOOD. You mean that just because troops come back by air they do not get this assistance?

Colonel WOOD. It would be given to them if they relapse with malaria; but administratively it is a very difficult matter. The troops on the other side who are en route home do not want to stay around 2 weeks in a camp awaiting air transportation. They come back by air because they are in a hurry; then when they set foot in this country, there is tremendous pressure for them to get to their destination.

Mr. FLOOD. What is the nature of this 14-day treatment? What does that mean?

Colonel WOOD. One tablet per day is given by mouth for 14 days. Each tablet contains 15 milligrams of the drug.

Mr. FLOOD. They do not have to be put to bed?

Colonel WOOD. No. You can retain your normal activity.

Mr. FLOOD. Do the troops who are in the field take this treatment?

Colonel WOOD. We only give it when they come out of malarious areas.

Mr. FLOOD. Only from certain areas that you know are malarial?

Colonel WOOD. For instance, Japan is nonmalarial, but anywhere in Korea it is malarial, but more particularly in the southern part.

Mr. FLOOD. Is malaria infectious as well as contagious?

Colonel WOOD. It is only transmitted by mosquitoes.

Mr. FLOOD. It is transmitted by mosquitoes only?

Colonel WOOD. Yes, sir.

Mr. FLOOD. All kinds?

Colonel WOOD. No; only anopheline mosquitoes.

Mr. FLOOD. I was referring to all categories of the disease; they are all transmitted by mosquitoes?

Colonel WOOD. Yes; all categories of malaria; that is true.

Mr. FLOOD. What is the matter with this primaquine? What does it do that is not good?

Colonel WOOD. Nothing at all that we know of. It has worked wonderfully so far.

The only difficulty with it, you must not take excessive doses of it, because it becomes then a toxic drug. It is not the kind of thing that we give a soldier to carry in his pocket when he is, for example,

on leave. He might miss 2 or 3 days and then suddenly think that he has got to catch up and take four tablets at once. If he does that, it is bad.

Mr. FLOOD. What kind of trouble comes from that?

Colonel WOOD. The toxic symptoms of an overdose of the drug—he may have cramps in his intestines and vomit, and so forth.

Mr. FLOOD. It is a temporary matter?

Colonel WOOD. It is temporary; yes.

Mr. FLOOD. Have you abandoned quinine and atabrine?

Colonel WOOD. Quinine and atabrine are obsolete, made so by chloroquine, which is ever so much a better drug.

Mr. FLOOD. What about the raw materials necessary for these? Can we develop them or produce them in continental United States?

Colonel WOOD. Yes. It is made altogether here, sir.

BUBONIC PLAGUE

Mr. FLOOD. Do you have any vaccines, or anything else, for the bubonic plague?

Colonel WOOD. Yes, sir. We have a vaccine which we have been using since World War II which has been further improved, and very active work is going on in this field, particularly in Dr. Meyers' laboratory in San Francisco.

Mr. FLOOD. Have troops in the Orient ever been infected by the bubonic plague?

Colonel WOOD. I do not recall that we have had a single case.

Mr. FLOOD. You have never had one?

Colonel WOOD. No, sir.

Mr. FLOOD. Have the Marines ever had such a case?

Colonel WOOD. I do not believe so; none of the American troops.

Mr. FLOOD. At any time, anywhere, so far as the records show?

Colonel WOOD. Are you referring to the present Korean conflict?

Mr. FLOOD. No; I am referring to the record in the history of our service. Have we any records of such cases?

Colonel WOOD. I do not know the statistics offhand, but I am almost certain that, if you search back far enough, you will find a few cases.

Mr. FLOOD. As far as the Medical Service is concerned, you have never had any cases in modern times, although you have vaccines prepared?

Colonel WOOD. That is correct.

Mr. FLOOD. Are these vaccines effective?

Colonel WOOD. Control tests show that they have some effectiveness. They are not believed to be 100 percent effective in preventing disease, but in modifying and in ameliorating it, and giving a milder case—certainly it does that.

Mr. FLOOD. Is it a chemical vaccine? Where do you get it?

Colonel WOOD. You are still talking about the bubonic plague?

Mr. FLOOD. Yes.

Colonel WOOD. It is a bacterial vaccine which is grown out of artificial media here.

Mr. FLOOD. In the last 2 weeks, have you made any effort to get to our prisoners of war in Korea, through any source whatsoever—the Red Cross or otherwise, if you can—in connection with the existing bubonic plague in North Korea?

Colonel WOOD. I do not know. That would be handled by our Plans and Operations people rather than by our Research and Development people.

Mr. FLOOD. Have you been contacted, or have you been requested for information, by any branch of our armed services or any of the civilian services in connection with this problem that exists today in the prison cantonments in North Korea?

Colonel WOOD. Not in Research and Development; no, sir.

Mr. FLOOD. Do you have a supply of this vaccine available if it is needed?

Colonel WOOD. The vaccine is available now; yes, sir.

Mr. FLOOD. How long can this bubonic plague vaccine be stored?

Colonel WOOD. At least a year in the refrigerator.

Mr. FLOOD. How long does it take to create it?

Colonel WOOD. It can be made in great quantity on short notice.

Mr. FLOOD. In other words, a man can get a shot right away, if necessary. And by right away, how long would you mean?

Colonel WOOD. It takes several weeks, sir, because you have to allow time for the growth of the bacteria, for it to be harvested, and it has to be tested for sterility, and so forth in animals before it is released. There are certain standards which have been established by the National Institutes of Health by which we have to go.

Mr. FLOOD. It appears to me, General, that somebody should have thought about this some time ago. Here we have 5,000 men in these prison cantonments in Korea. I do not know whether it would do any good, but certainly it is in the interest of the Army and of the Armed Forces generally that someone should make inquiry immediately as to whether or not they would let us take it in there for our own prisoners of war. I am surprised that it has not been done.

General DECKER. Mr. Flood, I am sure it has been thought of. These are not the right people to address that question to. If you agree, the question will be discussed during the hearing of the medical program.

Mr. FLOOD. Yes, I would like that, if you would.

Have any of these men been vaccinated for bubonic plague?

Colonel WOOD. No, sir. Not yet.

Mr. FLOOD. Are any of our troops in the Korean activity vaccinated against bubonic plague?

Colonel WOOD. No, sir.

Mr. FLOOD. What is the life of plague vaccination?

Colonel WOOD. It is reasonably effective for about 6 months and then it tapers off.

Mr. FLOOD. How many shots are given in the treatment?

Colonel WOOD. Three shots.

Mr. FLOOD. About a week apart?

Colonel WOOD. About a week apart; yes, sir.

Mr. FLOOD. It lasts for 6 months, you say?

Colonel WOOD. It lasts 6 months upon completion of the vaccination in fairly effective form and then it tapers off thereafter. Such people are not without immunity completely, but they are not up in their immunity.

Mr. FLOOD. What has been the biggest problem that the research men have been asked to go into, so far as the Korean theater of operations is concerned, and the Arctic operations of last year, and the Fort Drum experiments of the last month—or is that too recent? Let us take them up in reverse order. What did you find out about the Fort Drum operations?

Colonel WOOD. We have an observer up there, but we do not have reports in yet. It is too early.

Mr. FLOOD. What about the American-Canadian Arctic operations?

Colonel WOOD. I, myself, have recently been in Alaska and have studied the problems at first hand. I was there January 5 to 18. Our problems are in good shape for our current Alaskan operations.

Mr. FLOOD. What were your problems there and by whom were you called in?

Colonel WOOD. I was interested primarily on this trip in the medical field service, the rescue of and the evacuation of casualties should we have to fight over the snow. We have many problems yet to be solved in that area, particularly the equipment for evacuation and shelter of casualties en route.

We are beginning a very vigorous campaign in order to solve those problems.

In fact, on Friday we had a meeting of all concerned, including people from Alaska, on these problems.

Mr. FLOOD. I am interested in that for this reason: I had a conversation 2 years ago with the Finns. They were trying to explain to me the problems that they had in the Russian-Finnish fight of several years ago. They described, and had pictures of, the horrible problems of the medical people and the corpsmen in connection with superficial wounds or shock wounds.

The incidence of fatality was appalling.

Colonel WOOD. That is right.

Mr. FLOOD. I hope that sooner or later we are going to establish units of division size in the north, as permanent northern troops; not take some people in khakis from Panama and ship them up there, but establish career cold-weather troops, officers and men, just as the Russians and the Finns and the Germans do.

Colonel WOOD. That would be an excellent move.

Mr. FLOOD. What are you people trying to do about it? Elaborate fully.

Colonel WOOD. We have gone into those problems very extensively on the ground up there, getting advice from people who have lived on the trails, who have gone out at 50° below zero for days at a time.

We have discussed the problem of what to do, from the time that a man falls—which first presents the problem of finding him. He will be wearing overwhites for camouflage, and he will go down in the snow, and if the snow is drifting it will cover him in a few minutes, if he is unconscious.

Mr. FLOOD. Do you provide him with any kind of a tablet or a dye, such as the Air Force provides for use in snow, to permit a man who

is wounded and knows that he is going to pass out to mark his location?

Colonel WOOD. Now, no. The problem is well in hand. We have many ideas which will be tested in the Arctic.

Mr. FLOOD. How long have you been testing these things in the Arctic? You know, the snow has been up there a long, long time. Why is it that we are always taken by surprise and are always just in the process of getting ready to do these things? It has been cold up there a long time, Colonel.

Colonel WOOD. Yes, sir. This statement should be off the record, if you please.

(Off the record.)

Mr. FLOOD. I hope, Colonel, that we are not going to wait, as we did in the case of Korea, before finding out and doing something about these things. We have been in operation for some 160 years all over the world. We sent troops into Korea and there was a shocking incidence of frostbite, because of lack of training or lack of equipment or a combination of circumstances. I suppose that your shop is at fault somewhere, in the matter of instruction or medication, or something. It is difficult for me to imagine that you are not responsible, along with the Quartermaster and with the field commanders. Everybody must have been at fault. But we waited until we had a bad winter campaign in an area where the winters are not particularly worse than they are in places where you have been before. And yet we had a shocking incidence of frostbite in the extremities, where you should expect it. And we had bad respiratory conditions for the first couple of months.

Why did that happen?

Colonel WOOD. Respiratory conditions? I did not know about any unusual incidence of respiratory diseases.

Mr. FLOOD. In the first Korean winter?

Colonel WOOD. No, sir; it was not remarkable, what we had there.

Mr. FLOOD. Very well. I do not know whether it is correct or not but my information was that you had an altogether unnecessary and inexcusable number of cases of respiratory illnesses among the first troops that were out there.

Colonel WOOD. That is not true, sir.

Mr. FLOOD. All right, good. What about frostbite in the extremities?

Colonel WOOD. The frostbite was due to a combination of things. In the first place, we sent troops in on short notice. As you well know, it takes time to train a man to use cold-weather gear. He does not know the value of it. And you cannot fight an enemy 24 hours a day and give that instruction in the front lines, too.

Mr. FLOOD. But Japan is not in the South Pacific, and Japan has mighty cold weather.

Colonel WOOD. About like Washington.

Mr. FLOOD. But there are areas in Japan where you could train cold-weather troops. Was anything done about that, as far as you know? Of course, I know you are not a training officer, but did anybody inquire of you to help them in the training of troops in Japan for cold-weather operations?

Colonel WOOD. We do not enter into the training phases, sir.

Mr. FLOOD. But you have to be taken into consideration in any kind of training operation having to do with physical welfare, do you not?

Colonel WOOD. Not in Research and Development; no sir.

Mr. FLOOD. Not in the physical end of it?

Colonel WOOD. We have other divisions of the office; Plans and Operations, and Training and Education.

Mr. FLOOD. Does Research and Development have any medication which enters into these cold-weather warfare operations?

Colonel WOOD. We have been asked that question a number of times and have considered in great detail the answer, but the answer is "No," there is nothing that you can give. We wish there were and we are on the lookout for such a thing. But none has been discovered.

Mr. FLOOD. But some of your basic research people are taking a look?

Colonel WOOD. Absolutely.

PROPORTION OF FUNDAMENTAL TO APPLIED MEDICAL RESEARCH

Mr. FLOOD. Considering the kind of work that you people are doing and the number of matters that you have been discussing, why is such an infinitesimal percentage of your request for 1953 earmarked for basic research?

Colonel WOOD. That is a misleading picture in this respect. This small amount down here [indicating on chart] that is earmarked for basic is truly 100 percent basic research, which has no immediate aim or goal whatever. It is just the seeking of new knowledge.

In this large category here [indicating] 36 percent of that is in basic research and must be in order to get the practical answers.

Mr. FLOOD. Thirty-six percent of what?

Colonel WOOD. Of this column right here, sir [indicating on chart].

Mr. FLOOD. What is the blue column? The blue is 1953?

Colonel WOOD. Yes, sir. This is, of course, an estimate for 1953, but 36 percent of the 1952 budget is actual basic research in connection with problems.

Mr. FLOOD. Are you a doctor of medicine, a scientist, or both?

Colonel WOOD. I am a doctor of medicine. I am a doctor of science, also.

Mr. FLOOD. Are you an M. D., Colonel Knoblauch?

Colonel KNOBLAUCH. Yes, sir.

Colonel WOOD. This is a misleading chart, in that a great deal of basic research is in there. It must be. We just do not have the information to proceed in certain things, without doing basic research in the field.

Mr. FLOOD. Now, your medical research activities all arise in connection with the physical welfare of troops as far as medicine is concerned?

Colonel WOOD. As far as medicine is concerned.

Mr. FLOOD. Does that include dental as well?

Colonel WOOD. That includes dental as well; yes, sir.

PSYCHIATRIC RESEARCH

Mr. FLOOD. You do not go into the area of psychiatric research; do you?

Colonel WOOD. Yes, sir; very much so. Our activity PO–15 is altogether psychiatric research.

Mr. FLOOD. Do you have a psychiatric man here this morning?

Colonel WOOD. No, sir; we do not, as such.

Mr. FLOOD. Are they stepchildren down there?

Colonel WOOD. Not at all.

Mr. FLOOD. Do you cooperate with them?

Colonel WOOD. We try to cajole them into helping us. There is, as you know, a tremendous shortage of psychiatrists, and unfortunately their opportunities are quite lucrative in the ordinary practice of medicine. It is hard to get them to engage in research entirely.

Mr. FLOOD. How do you conduct research and development in the area of psychiatric problems?

Colonel WOOD. It is done in two ways. It is done by contracts with leading universities——

Mr. FLOOD. What would be the nature of the experiment? What would be the type of development? What would be the scope of the research?

Colonel WOOD. Some typical problems concern neurocirculatory asthenia, where the man is a jittery type, unable to function if he gets scared. There are problems of selection and proper assignment of personnel from a mental standpoint, problems of traumatic experiences which occur in transition from civilian life to military life, and what we can do to make that transition less traumatic to the man, problems of readjustment of front-line casualties and just what we commonly call battle fatigue.

COMBAT FATIGUE

Mr. FLOOD. Is that a problem of any magnitude?

Colonel WOOD. That is a major problem of the theater—a combination of actual fatigue, actual worry, fright, loneliness, and all sorts of things enter into it; but it finally nervously exhausts the man.

Mr. FLOOD. What percentage of our casualties in the first 30 days among fresh troops in front-line combat would be due to that?

Colonel WOOD. That will depend largely on the activities and the character of the operations in which the personnel are engaged.

Mr. FLOOD. Take the average operation in the theater of Korea. What percentage of battle-fatigue cases would occur in 30 days?

Colonel WOOD. That is only the wildest guess on my part to give an answer, for the reason that it depends altogether, almost, on how tough the going is for those troops. If they are essentially unengaged or in a quiet period of operations, it would be very low.

Mr. FLOOD. I mean the fundamental mission operation.

Colonel WOOD. Our over-all rates are of the order of 15 or 20 percent of our casualties are neurophychiatric casualties, but the most of them do not come out of the theater. We short-stop them at the front, give them a period of rest and treat them from the standpoint of psychotherapy. Then they go back to the line and hold up.

Mr. FLOOD. You do not just leave them to the chaplains and mess sergeants?

Colonel WOOD. No. We have psychiatrists and clinical psychologists who are working with those fellows, who take those men and give them treatment from the moment we get them in the forward installations.

Mr. FLOOD. What is the percentage of men who are put back in the line after being out a week or 10 days?

Colonel WOOD. Between 80 and 90 percent are returned to the line.

Mr. FLOOD. And the 10 percent who are not returned to the line have some contributory factors other than this?

Colonel WOOD. Yes. Their nervous system is not stable enough to stand combat.

Mr. FLOOD. It is a different problem?

Colonel WOOD. It is a different problem.

Mr. FLOOD. What percentage of the total casualties in a regiment would be this kind of casualties as against other kinds of casualties?

Colonel WOOD. If it is engaged in the average manner, about 20 percent of the casualties that come back from the regiment will be NP casualties. Some 80 or 90 percent will go back into the line again.

Mr. FLOOD. You tell me it would go as high as 20 percent?

Colonel WOOD. As high as 20 percent of the casualties.

Mr. FLOOD. From battle fatigue?

Colonel WOOD. That is right.

Mr. FLOOD. Is this a result of our modern type of civilization and modern life? Is that increasing the acuteness of the problem of this kind of casualty? I do not know whether that would follow, but it would seem to follow. Now, are the psychiatric people, since they are dealing with 20 percent of the casualties, getting 20 percent of your attention in this budget and otherwise?

Colonel WOOD. Approximately that; yes, sir.

Mr. FLOOD. It works out about right?

Colonel WOOD. Yes, sir. Our great difficulty, as I say again, is finding competent psychiatrists to do the work.

Mr. FLOOD. You cannot help that.

Colonel WOOD. No. It is that difficult a proposition. We are appealing to people who can help us to help us find people who can do this work, and it is a hard job. Some of it has to be done in our own shops.

MEDICAL RESEARCH IN GERMANY

Mr. FLOOD. What are your medical people in Germany asking for R and D?

Colonel WOOD. Research on hepatitis is the principal thing. They are, as you know, in an endemic area. There is a high hepatitis rate in Germany and Austria, and that is their principal problem. Otherwise, their problems are much the same as they are in the States—just the general line.

VENEREAL DISEASE RESEARCH

Mr. FLOOD. What are you doing on VD and the other diseases?

Colonel WOOD. We are doing a great deal. We have a treatment for gonorrhea, for example, where we have it down to practically a 1-day problem. We have the treatment for syphilis down to a very short

affair. In fact, prevention is so good that our syphilis rate is almost nothing in Korea. Gonorrhea and chancroid are our problems.

Mr. FLOOD. VD was a bad problem at one time in Korea?

Colonel WOOD. Early in Korea we had some problems.

Mr. FLOOD. In the early occupation days?

Colonel WOOD. That is right; but nothing like the World War II European affair of syphilis.

Mr. FLOOD. Or the early German affair?

Colonel WOOD. Right.

Mr. FLOOD. Incidentally, is that part of your job—the preparation of those instructions?

Colonel WOOD. We collaborate with the Education and Training Division, especially where something new comes in. That is a matter for the Research and Development Board.

Mr. FLOOD. You are just Army?

Colonel WOOD. Just Army.

Mr. FLOOD. The other people run their own show of R and D in this field?

Colonel WOOD. But it is all coordinated through the Research and Development Board and the various committees. I meet with my counterparts in R and D in the Navy and Air Force regularly. In fact, we have a meeting scheduled for today.

CURRENT MEDICAL RESEARCH PROBLEMS

Mr. FLOOD. What is the chief thing you are doing now, either on the record or off the record; what is your priority project right now above everything else?

Colonel WOOD. It is hard to lay your finger on any one, but if you speak of my personal interest, the thing I think ought to be stressed is this Alaska medical field service problem, on which we met Friday. We have many other burning problems. Sterilization of blood plasma is one of the things that are outstanding.

Mr. FLOOD. In that, is the only problem the virus of jaundice?

Colonel WOOD. It is sterilizing blood plasma, trying to destroy the virus of serum jaundice; and that is a most difficult problem.

(Discussion off the record.)

RUSSIAN MEDICAL RESEARCH

Mr. FLOOD. Do you have any information at all about what the Russians or the Czechs are doing? They used to do a great deal.

Colonel WOOD. On blood plasma?

Mr. FLOOD. Yes.

Colonel WOOD. We have no information, except we know they do not use anything like the amount of blood plasma that we do.

Mr. FLOOD. They just do not bother?

Colonel WOOD. They neglect their casualties by our standards.

MEDICAL PROBLEMS PECULIAR TO SEX

Mr. FLOOD. Do you have any special kind of research and development that has to do with the female contingents of our Army, or is that the same kind of operation in R and D? Are you giving any

special attention to problems peculiar to the female branches of the services?

Colonel Wood. We are not at this time.

Mr. Flood. Are there any problems?

Colonel Wood. In general, no, sir; there are not. That is to say not generally in the field, and that is where our interest is centered—on the fighting men in the field, the fighting men in combat. The females are young and vigorous, and in general they have the same problems as the males. Preventive medicine-wise and injury-wise, there is no distinction made between them. If you are talking about the older females, the older nurses and so forth, of course, they have the diseases peculiar to women.

Mr. Flood. It is no problem, then; if any case arises, it is no problem?

Colonel Wood. That is right. It is no problem.

EMPLOYMENT IN MEDICAL RESEARCH AND DEVELOPMENT PROGRAM

Mr. Riley. How many new employees do you have in the Medical Corps R and D organization over last year?

Colonel Knoblauch. The total for 1952 is 415; for 1953 it is 503 man-years.

Mr. Riley. I believe you testified this morning there was about $600,000 money involved in the new employees. Is that correct?

Colonel Dudley. Yes, sir.

Mr. Riley. That is an average of around $6,500 or $6,600 per employee. Do you consider this new personnel absolutely essential to the success of your program?

Colonel Knoblauch. Yes, sir.

Mr. Riley. There is no way in which you could curtail this expense somewhat and still achieve the necessary results?

Colonel Knoblauch. I do not know how we can, sir.

Colonel Wood. We made quite a search among our institutions to see what of their activities might be carried out under contract; 60 percent of our work is so carried out now.

Mr. Riley. Under contract with the other services?

Colonel Wood. No; under contract with civilian institutions. And these represent functions of the types that we cannot get civilian institutions to do for us. It entails constantly working with military personnel and equipment and working in the overseas theaters.

COORDINATION OF MEDICAL RESEARCH

Mr. Riley. How much duplication of research is there between the three services in the medical field?

Colonel Wood. I believe it is entirely fair to say there is only that which is deliberately contemplated and intended. Some duplication is obviously desirable in order to obtain different approaches to the same problem and to have different groups attempting to come up with the answer. They do not ever come up with exactly the same answer. To really duplicate research is almost impossible, but in working on the same problem there is some duplication; but it is known and is thoroughly discussed and is only done because it is desirable.

Mr. RILEY. Do you think that pays dividends?

Colonel WOOD. Yes, sir; frequently it does.

Mr. RILEY. By having different organizations doing the same work?

Colonel WOOD. Yes, sir; sometimes you come up with two approaches, whereas, if you had taken only one, you would come up with an inferior answer, possibly.

Mr. RILEY. What about civilian research and development in the medical field?

Colonel WOOD. I think there is practically no chance of that, because we are all coordinated in the same place; that is, all of our research proposals are passed on by the National Research Council or by the Armed Forces Epidemiological Board, and all of the projects are passed on by the Office of the Secretary of Defense R. and D. Board, and there they deal with all three services.

Mr. RILEY. Do you make a survey among the civilian research institutions to see just what programs they are following so as to avoid duplication by the military services?

Colonel WOOD. Yes, sir; we have set up in the National Research Council an office run by Dr. Stella Leche Deignan, called the Information Exchange Center. She obtains from all of the Government services—not just from the Armed Forces, but from Public Health, Civil Defense, the Food and Drug Administration, and so forth—a complete statement of every project they are working on in the services and under contract with civilian institutions, with an analysis of precisely what is being done, who is doing it, what the objectives are, and how much money is going into it, and at a minute's notice we can call on her for any particular subject and ask who is working on it, where it is being done and to what extent, and she can give the answer.

Mr. RILEY. Do you avoid programs similar to ones that civilian researchers are pursuing?

Colonel WOOD. In general, we do. But you have to bear in mind that about two-thirds, I believe, was the figure given by Dr. Whittman last night, of all of the research in the country is now supported at least in part by the Government. So a very considerable amount of the research is coordinated in that manner.

I do not know of any direct duplications between ourselves and civilian institutions. Of course, our civilian contractors do know what is going on in their particular institutions. It is also true that all of the committees of the National Research Council and the Armed Forces Epidemiological Board know what is going on in civilian medicine as well as in military medicine, and that is also true in the Armed Forces R. and D. Board.

General MARIS. Also, you avoid heart disease, cancer, and those things?

Colonel WOOD. Yes; research on diseases of old age, cancer, and conditions of that kind we do not undertake. We leave them entirely to civilian research or to the Public Health Service.

Mr. RILEY. It would seem to me that ought to be pretty carefully screened, because of the shortage of medical men now, to see that these programs are not being duplicated; because by not duplicating them you would have some good talent and experience to work on other things.

Colonel Wood. Yes, sir. It is very carefully screened.

There are one or two items I have that might be of interest to the committee if I might point them out.

ARTIFICIAL RESPIRATION RESEARCH

Colonel Knoblauch mentioned the artificial respiration work which is carried out as a tri-service affair, both the Navy and the Air Force participating with us in this. It was actually not a large venture, and very little money was actually spent on the program, but, in the study of chemical warfare resuscitation after nerve gas disablement, we found the Schafer method, which is the one that has been tried for 20 or 25 years or more in this country, in which the pressure is applied by the operator on the back and then the pressure released—it is a push and release affair—did not prove adequate for the resuscitation of casualties, because not enough air could be gotten in and out of the lungs by that method. So we sought better methods and examined a very considerable number of methods in a preliminary sort of way. There was not an answer physiologically at that time anywhere in the literature, although this problem has been discussed for 40 years, to clearly delineate one method as superior to another. So four physiologists and their assistants undertook, with modern physiological methods, to study this problem intensively for a 6-month period. They adduced absolutely definitive data that proved once and for all which methods were good and which were not so good, and that the double-action method is better than this single-action method, where you push the air out and then let it come back in by the chest's own elasticity. The arm-lift back-pressure method proved to be best from a practical standpoint—easy to teach, easy to learn, and efficient in ventilating the lungs.

This method was actually developed in the Scandinavian countries by a scientist, Holger Neilsen. It was modified only slightly. In this method, the operator stands at the patient's head instead of straddling the legs and grasps the arms just above the elbows and gives a pull back toward himself and then up toward the top of the patient's head. That automatically pulls air into the chest. In other words, you have inflowing air not dependent on the chest's elasticity.

Mr. Flood. Will you call somebody in and demonstrate that on the floor?

Colonel Wood. Yes, sir. Then the arms are returned to this position [illustrating], and then the operator leans over the patient and presses on his back, similar to this [indicating], except in an upside down position.

Mr. Riley. Does he press in an opposite direction from the other method?

Colonel Wood. He presses straight down; he moves forward and pushes his weight straight down on the chest and then releases.

Mr. Flood. Is not that body lying stomach down?

Colonel Wood. Yes. It is lying face down, with the face turned to one side.

Mr. Flood. Then how is he going to press on anybody's chest?

Colonel Wood. He presses on the back of the chest, back of the thorax, I should say.

Mr. FLOOD. All four operations are performed while the subject is lying down?

Colonel WOOD. Yes. The position of the patient's body does not change. Those are four successive positions and movements. You grasp the arms, pull up and forward.

Mr. FLOOD. It is the same as the old method, except you operate from the head?

Colonel WOOD. The bottom half is the same as the old method, except you are upside down. This is a push and release, but added to it is this pull and release part.

(An actual demonstration was given at this point.)

Mr. RILEY. Would that exercise be proper in a case of shock?

Colonel WOOD. In the case of shock or drowning.

Mr. FLOOD. Or smoke inhalation?

Colonel WOOD. Anything at all. This method has now been adopted by all of the agencies in this country—by Federal Civil Defense, the American National Red Cross, Boy Scouts, Girl Scouts, utility companies, electric and gas companies, and so forth, and it is the accepted method now.

Mr. FLOOD. Is this a development of American basic research; did we think this up?

Colonel WOOD. This is our application of a method which was developed many years ago first in Denmark by Holger Neilsen. Of course, there are times when you cannot use that means—for instance, where a man's arms may be broken or he may be badly wounded.

Mr. FLOOD. This is something the Danes thought up?

Colonel WOOD. Yes, sir. But we have many times tried to introduce it in this country and our people would not accept it, because they had no proof it was any better than the Schafer method. We produced the proof.

Nearly all research and development items have people working on them all over the country and all over the world.

Mr. FLOOD. Is it just that they are luckier than we are?

Colonel WOOD. No. They take our stuff and do the same thing with it.

Mr. FLOOD. I am sure of that.

Colonel WOOD. Somebody puts it to use finally, and in this case we put it to use because it was not accepted in this country before. We proved it.

DEVELOPMENTS OF AMERICAN BASIC RESEARCH

Mr. FLOOD. Will you do this if it will not embarrass you too much; will you give us a list of developments originating from your own basic research? You can start off with the malaria treatment, because I think that is terrific after what we saw in the last war. Without describing at any great length, within the confines of security, give us a list of what you boys have given birth to for the record. Because every year somebody stands up and says, "Here is research and development, so many millions of dollars," and every year you stand there all day telling how you developed the Russian tank and the Danish respirator, and you name off the whole United Nations roster, and finally come up with one thing and say, "This is ours," and we look foolish. Let us have some ammunition this year so that

we can say, "Look, this is what we did, and everybody is using it, too."

Colonel WOOD. You want some all-American stuff?

Mr. FLOOD. Yes.

Colonel WOOD. There have been developed in this country three outstanding antibiotics which we have put to use in very outstanding ways. I will tell you about them. They are aureomycin, terramycin, and chloromycetin. Those three antibiotics are wholly American developments with which no foreigner had anything to do. We have put these to work in Korea, where we had to combat more bacillary dysentery and amebic dysentery than we had in 20 years in this country, and we now know how to combat it. We can cure the worst type of bacillary dysentery in 6 days.

Mr. FLOOD. After bacillary dysentery is in the walls of the intestines for 6 months, can you cure it?

Colonel WOOD. Absolutely. We can cure any case in 6 days, and a man has no more symptoms in 2 days.

Mr. FLOOD. Suppose I am on an island and have a bad case of bacillary dysentery and do not get back for 6 months.

Colonel WOOD. We can cure it in 6 days, the same as if it was a brand new case. And we can do the same thing with amebic dysentery in 11 days. We have cured in 11 days the worst case of amebic dysentery that has ever been found.

Mr. FLOOD. It has been indicated that these amebic dysenteries are of various types and kinds. Have you the material for combating dysentery cancer which will result after a period of years if not treated?

Colonel WOOD. Yes, sir. Cancer is not caused by dysentery but liver abscess may be. We can prevent or cure that.

Mr. FLOOD. This will be a great help, if you have that kind of thing.

Colonel WOOD. Because we have another drug, which is wholly an American development, called chloromycetin, which, when used in conjunction with chloraquine, absolutely prevents amebic abscess from amebic dysentery.

Mr. FLOOD. How available is this kind of effective medication for civilian practice?

Colonel WOOD. It is entirely available and is being published in the literature.

Mr. FLOOD. How new is it?

Colonel WOOD. It is brand new. The results are not all in. We have treated more than a thousand cases.

Mr. FLOOD. Those medicines you just mentioned as being new are all American discoveries?

Colonel WOOD. Entirely American.

Mr. FLOOD. Are they available for civilian medication?

Colonel WOOD. They are available on public sale in any drug store now.

Mr. FLOOD. And have been for how long?

Colonel WOOD. Terramycin, the last one, for about a year. The others are all longer.

Mr. FLOOD. For what purposes do civilians put those to use?

Colonel WOOD. All sorts of infections—surgical infection, pneumonia——

Mr. FLOOD. Can these "mycins" be taken orally?

Colonel WOOD. All three of those are taken orally.

Mr. FLOOD. They are for simple medication?

Colonel WOOD. Simple medication.

Mr. FLOOD. Is it advisable for them to be purchased and used without prescription; can you say that?

Colonel WOOD. They should not be.

Mr. FLOOD. They should not be. And these are the results of your R and D in the Army?

Colonel WOOD. That application to dysenteries is wholly Army and Navy R and D. The Navy cooperated with us in doing the laboratory work in their laboratory ship. Otherwise it is Army.

Mr. FLOOD. And that has resulted in benefit to countless thousands of civilians in the United States and throughout the world since then?

Colonel WOOD. It will.

Mr. FLOOD. And progressively will be more so?

Colonel WOOD. Indeed so. We fear these diseases no more.

(Discussion off the record.)

CONTACT LENSES

Mr. FLOOD. Now, Colonel, I want to ask you something about correction for the eye for field purposes. What are you doing about that—glasses for combat troops? What do you call these things you put inside the eyes?

Colonel WOOD. Contact lenses.

Mr. FLOOD. What are you doing about contact lenses? How can we pick up this unnecessarily large list of selectees in selective service who are limited servicemen because of eye defects? If you are on the job or have good people on the job, you should be able to pick up a certain percentage of that kind of limited servicemen for combat duty.

Colonel WOOD. We are doing a fair amount. But about contact lenses, I should answer first that we have had Dr. Smelzer at Columbia University working on contact lenses for a period of 2 years to try to solve basic problems connected with clouding of the cornea and creating a halo, and he found a man can wear it for 4 hours and then he is done.

Now, we have sent soldiers which we picked for this purpose to England and a number of places in this country, and they have been fitted with every available type of contact lens, even including modifications recommended by Dr. Smelzer, and those men are now at Fort Knox, Ky., where they are being studied under various types of occupations and conditions in the Army to determine the utility and wearability of these contact lenses.

Mr. FLOOD. Is there any doubt about the wearability and utility?

Colonel WOOD. There is a lot of doubt.

Mr. FLOOD. You must answer that question first?

Colonel WOOD. Yes. It is quite doubtful that this will be useful for anything except a rare few specialists who have such high skills that we must go to great lengths to retain them. Most of the defects can be corrected by ordinary glasses.

RESEARCH TO CORRECT PHYSICAL DEFECTS

Mr. FLOOD. Do you have any kind of program in your shop of R. and D. looking toward utilizing this great pool of manpower which we cannot now utilize in the defense forces because of various kinds of physical defect? I think it is outrageous to see people walking around this town and every town—and it is an old chestnut up in the hills, you know——

Colonel WOOD. Yes.

Mr. FLOOD. Why cannot somebody down in your bailiwick think up something which can make available to the defense forces the millions of perfectly good manpower material which is now unacceptable because of defects of a comparatively minor nature? Why cannot that be done? Our people are our greatest weapon; yet the people in the defense area are losing the advantage of a vast well of resources because of these physical exemptions. After these people line up in the draft board or after you get them, why does Hershey lose so many of them, or why do you lose so many of them after you get them? There is research that is beyond everything else if you can solve that one.

Colonel WOOD. A great deal is being done. I do not know whether you know it or not, but the men are now being returned to active-duty status after a major amputation, after the loss of a leg or even an arm—particularly leg amputees. They are being returned in considerable numbers now to active duty. That formerly was not done.

We are working with the Adjutant General and the psychologists on the G–1 staff in developing what we call the physical profiles of the men.

Mr. FLOOD. I do not want you to lose the theme. That comes next. That is rehabilitation. I have not gotten that far. Those are prosthetics, where you are in an area of rehabilitation. That is good, but we are not there yet.

General MARIS. May I indicate we have coming up here later the people who have the data on the human resources research area, which will be given shortly.

Mr. FLOOD. But this witness is good enough.

General MARIS. This is only on the medical side.

Mr. FLOOD. What do you do about it?

Colonel WOOD. We are working with the Adjutant General in particular on the selection of personnel, trying to reduce the standards provided they can be tied with jobs by this profile business. In other words, there may be jobs which may be safe for a man to do who could not do combat duty or fire artillery, but he can release a man who can do combat duty by taking over a job which a less-than-perfect man can do.

Mr. FLOOD. You people are finally convinced that manpower is our bad problem?

Colonel WOOD. It is a tough problem and always has been.

Mr. FLOOD. Some of our potential enemies do not have that problem, but we have a bad manpower problam in adjusting between the defense area, and the civilian economy for civilian or defense production purposes. What can you do to solve that in medical R. and D.?

Colonel WOOD. We are profiling the men to determine whether they can be used at all in the military service and, if so, then from their

profiles we know what kind of jobs they can do; because their profiles are concerned not only with the man's physical condition but the job he can do. We are trying with the Adjutant General to put two and two together so that we can come up with the jobs that less-than-perfect men can do efficiently.

PROTECTION AGAINST HIGH COST OF SERVICE-CONNECTED DISABILITIES

Mr. FLOOD. Are we going to be protected from unnecessary pension cases for service-connected disabilities and partially service-connected disabilities?

Colonel WOOD. That is the next factor. We cannot take a man with a disease that we know is going to be progressive, for the reason you incur immediately a liability of the Government to that man. And it can be contended from now on—and the man will win every time—that the service aggravated his condition.

Mr. FLOOD. I am for that. I hope he does. That does not make me unhappy at all. But keeping that premise in mind, you are aware of the potential progressive burden on the taxpayer of an existing medical condition that may be aggravated.

Colonel WOOD. Beyond that, there is the problem to pick up non-progressive disabilities and use those as best we can in the service.

Mr. FLOOD. Do you think there is any hope, in case we have to have selective service or have UMT for 15 or 20 years that your program will be a material factor in bringing to the service additional manpower?

Colonel WOOD. I am quite certain it will, for the reason that as soon as we get all of our profiles developed—and they are actively being developed—we will be able to use more of the less-than-perfect men than we now use.

Mr. FLOOD. Can you pick a percentage at this time?

Colonel WOOD. I cannot.

Mr. FLOOD. Because by so doing you will be materially contributing to the birth rate of this Nation in direct ratio to what you do about salvaging people for the defense forces. You will be putting the chart up vis-a-vis the birth rate for that particular class of induction.

Colonel WOOD. A choice always has to be made as to whether this man would be more useful in industry or would be more useful in the service.

Mr. FLOOD. That is not your problem. But if the policy board decides that, you are going to help them in the next 10 or 15 years in your own way?

Colonel WOOD. Yes. I think our best move is the one we are on now, that is, to try accurately to profile all of the jobs in the Army and fit the man's physical profile to the job. I think we can use men who are less than perfect for many jobs.

Mr. FLOOD. I am sure about it. There is no doubt in my mind at all.

DRESSINGS

Mr. RILEY. Now, do you have some exhibits you want to show the committee?

Colonel WOOD. Yes. This [exhibiting] I thought might be a matter of interest to the committee. This is one which you can credit wholly

to our shop, because it was all done by our medical R. and D. board, by our contractors.

This is a large dressing which was developed initially for large burns. This will cover the whole front or back of the trunk, one entire leg, one entire arm. It is quickly put on and saves a great deal not only in dressing time but in cost.

The cost of this dressing is roughly $1.50, and two bandages—which I will tell you about in a moment—are used to put it on, which runs the cost to approximately $2. This takes the place of between $5 and $6 worth of surgical dressings which are ordinarily used for such cases. So, it represents a very real saving. It puts the cost down about 40 to 33 percent of the cost of dressing them as we formerly did.

This is a rather unique dressing. It contains one layer of surgical gauze which you can see here.

Mr. FLOOD. May I interrupt for a moment? If it is not too much of a burden in man-hours of research or mathematics, can you find out what was the total cost in the last year of the last war for that kind of surgical dressing, at $5 an application; and, since this cost $2 for one application, how much would the saving have been in that operation?

General MARIS. I think we can get you an estimate.

Colonel WOOD. It would have to be an estimate.

Mr. FLOOD. It would be a large figure.

(The information requested is as follows:)

If the "universal protective" dressing had been available for use in the last year of World War II, it is estimated that approximately $280,000 in the cost of surgical dressings would have been saved. This is based upon the approximately 400,000 battle casualties incurred from August 1944 through July 1945, about 10 percent of whom required an estimated average of two large dressings each (20,000 cases, or 40,000 dressings), at an estimated average saving of $3.50 per dressing.

Colonel WOOD. Yes, sir. This layer of surgical gauze has about a half inch of cotton and 15 layers of cellulose paper which are highly absorbent. The outer six layers of this paper are impregnated to render them waterproof to liquid, water, but still allow evaporation of moisture.

The back layer is again a type of paper called masland. It is quite tough, and is very difficult to tear.

This is the dressing which was developed first for burns. After testing it thoroughly in this country, we sent it to Korea. This was welcomed with open arms over there and was used, not only on burns, but 90 percent of them on wounds.

This is an extremely valuable dressing for large and multiple wounds, and it saves a tremendous amount of time to the surgeon in dressing the case. So, its name was changed from "burn" dressing to "universal protective" dressing.

It comes in two sizes. This is the large 36-inch size. It comes in half that size also; it is 22 inches in width. The smaller sizes are used for a forearm or the leg from the knee down or the thigh up.

Mr. FLOOD. Can it be cut up into sections, if necessary, without affecting the value of its use?

Colonel WOOD. Yes; it can be cut easily in half or smaller pieces, if necessary.

Mr. FLOOD. It may not be desirable but, if necessary, it can be done?

Colonel WOOD. Yes. We will stock this in two sizes. In fact, it is in procurement right now.

The big problem about this dressing was what to put it on with, because, when you use this masland paper—it is a bit on the slick side—when you put on big dressings, the surgeon's greatest problem is to keep the dressing put and not have the thing slip. You have seen big dressings slip; the bandage comes undone.

Mr. FLOOD. Is this a field dressing?

Colonel WOOD. A field dressing; yes, sir.

Mr. FLOOD. By that, you mean it may be applied in a field hospital or a first-aid station?

Colonel WOOD. This may be used right down to the battalion aid station.

Mr. FLOOD. And from there on up?

Colonel WOOD. From there on up, and also can be used back to the general hospital.

Mr. FLOOD. Not only may be but it should be?

Colonel WOOD. Yes.

Mr. RILEY. I imagine that the general hospital would be glad to get it?

Colonel WOOD. Yes. It can be used back to the general hospital.

The big problem was what to put this on with. We tried every bandage on the market. The ordinary bandage will slip off of this in a half a day, and you know what happens when a patient is even moving around in bed. We tried the various types of bandages, and none of them would work.

Then we got in touch with the Department of Agriculture and found that their southern regional research laboratories were developing cotton products and the scientists there had developed a way of shrinking the ordinary bandage by treating it with 20-percent sodium hydroxide solution, which is lye—just ordinary lye.

This causes the bandage to shrink about 50 percent in each direction, both in length and in width. The fibers get crinkly and curly, when seen through a microscope or a magnifying glass.

I would just like to have you note the tremendous cling that this bandage has when it is so treated. You can put it on here and it just does not slip or slide like an ordinary bandage does.

Also, it has the property of semielasticity in all directions. In other words, the bandage has a rather considerable stretch to it, in all directions, crosswise and lengthwise, which allows you to put this dressing on with the desired amount of pressure, and once in place it does not slip. It stays on, and we leave them on usually in the case of burns for 14 days without changing them.

This is turning out to be the ideal bandage. We had a great deal of difficulty inducing manufacturers to take this up and develop it, develop a commercial process for making it. But we now have two, and within 60 days we will have this commercially available.

Two will be packed with each large dressing ane one with each small dressing.

Mr. FLOOD. Is that kind of thing available for civilian use if desired?

Colonel WOOD. Not yet, sir. But it will be when our military needs are satisfied, I am sure.

Mr. FLOOD. Is that bandage or any part of it chemically treated for medicinal properties of any sort?

Colonel WOOD. No. Actually we use it unbleached. It is better than a pure-white bandage for our purposes.

Mr. FLOOD. I meant the other one.

Colonel WOOD. There is no medication; no, sir.

Mr. FLOOD. And is that available for civilian use?

Colonel WOOD. No, sir; it is not. It is available only for military use at the present time. But it will be available as soon as military needs are satisfied. Johnson & Johnson will market it.

Mr. FLOOD. The material in both of these bandages is made from raw materials that are available in continental United States, are they?

Colonel WOOD. That is right, sir. It is all cotton material. This entire thing is cotton. All of this is made right in this country.

We sent this for test to the general hospitals, Walter Reed here and Brooke in Texas. This bandage is so good that they want it for all sorts of purposes. It takes the place of an elastic bandage and the cost is only about half as much.

You do not have to twist it and turn it. It has enough elasticity to mold and it gives the pressure that the surgeon desires. It is a wonderful clinging bandage and they want it for all purposes.

And it costs only 10 cents more for a bandage of that size than an ordinary bandage.

Mr. RILEY. Will that cling to the human body?

Colonel WOOD. Yes, sir; it clings to anything.

Mr. RILEY. Is it as difficult to remove as the old adhesive?

Colonel WOOD. No, sir; it is nothing like it. You can unwind it right off. The problem that we had, or one problem that we had, was to make this dressing a bit smaller for shipment overseas.

Mr. FLOOD. That will not produce any circulation problem?

Colonel WOOD. No, sir.

Mr. FLOOD. It is just a superficial clinging that it has?

Colonel WOOD. You cannot put pressure enough on these unless you are really brutal with it.

Mr. FLOOD. In itself, it presents no problem?

Colonel WOOD. Not at all. Elastic bandages, bandages which have rubber in them, frequently have been put on too tight by inexperienced medical officers and surgeons, and then you are really in trouble.

Mr. FLOOD. What about head wounds? Can that bandage be used?

Colonel WOOD. It would be wonderful to put on head wounds.

Mr. FLOOD. I meant the other one [indicating].

Colonel WOOD. That is too big.

Mr. FLOOD. What about the smaller one? What do you call that big bandage, by the way?

Colonel WOOD. Universal protective dressing.

Mr. FLOOD. Can that, in any size, be used for head wounds, or is it not desirable?

Colonel WOOD. We use other dressings You could use it.

Mr. FLOOD. It has no special value for head wounds?

Colonel WOOD. It is developed particularly for big areas.

Mr. FLOOD. That binding bandage has special value for head wounds?

Colonel WOOD. Yes, that would. Head-wound dressings slip. This would be beautiful for that.

At present, with this bandage, one of the problems that we are still working on is this. We are not sure that this is the right answer, but this is put in an ordinary plastic bag and it is collapsed under high vacuum. This one has held up for 3 months. We are not sure that this is the right answer and we are trying to compress it for purpose of shipment overseas. We feel that we ought to make that a little tighter to save shipping space.

Mr. FLOOD. Is this good in any atmosphere or under any weather conditions?

Colonel WOOD. Absolutely. It may be used anywhere.

BONE PIN

The committee has not yet had a chance to see this bone pin. Again, this is an idea which was first proposed but not actually developed to the extent of clinical use on any scale by the Germans. We took up the idea and developed it in this country. Again, this was done wholly by the Army, or our Research and Development Board.

This is a way of treating fractures of the large, long bones, particularly the thigh bone.

In World War I, we lost half of our cases from shock when the thigh bone was fractured. Even in World War II, while we overcame the shock problem, we still had long, long periods in bed—9 months.

Mr. FLOOD. What do you mean by lost—fatalities?

Colonel WOOD. Fatalities, yes; from shock. That was in World War I. We overcame that in World War II and we lost practically nobody through shock. But we still had a long healing time. You have to put these cases up in a cast—generally in traction for a while, and then in a cast, which immobilizes the leg. The muscles atrophy, the joints stiffen, and when a man gets up, he has to learn all over again how to use his leg. He has a long period of physiotherapy to loosen his joints and build his muscles up again to what they were. The total requirement, as a matter of fact, we measure not in weeks but in years—that is, until he is normal.

With this method, this pin is actually driven down the length of the bone going through the marrow cavity. There are tools, if the cavity is not shaped just right, that ream it out, so that it fits exactly. This is the guided tool that is driven in first and this is mounted on it and driven right down the length of the bone.

Mr. FLOOD. What is that made from?

Colonel WOOD. Stainless steel. Once in place, then this holds the bones firmly together. This cannot be used in all cases, but in many cases it can be.

Once the bones are in place the man can take passive exercises in bed. He is out of bed weeks and weeks sooner than is possible by any other form of treatment. He is actually up and walking and never gets atrophied muscles or stiff joints and when the leg has healed, he does not have this long period of loosening up, with physiotherapy, to build up his muscles.

Mr. FLOOD. What is the life expectancy of the pin, after a man is discharged from the hospital?

Colonel WOOD. If it gives him no trouble, it can be left indefinitely in the bone and will do no harm. If he has any difficulty at either

end, as sometimes happens—he gets the feeling of pressure here or here [indicating].

Mr. FLOOD. Outside of that?

Colonel WOOD. Then the pin can be extracted in a rather simple operation.

Mr. FLOOD. After you extract the pin that has been driven through the marrow cavity of the bone, what does it do? What happens?

Colonel WOOD. Nothing at all. It is just taken out and he has no further trouble.

Mr. FLOOD. But if nothing happens, this thing stays in indefinitely?

Colonel WOOD. That is right; if it gives him no trouble, he can keep it in indefinitely and we do not have to take it out. It depends on the comfort of the patient.

Mr. RILEY. It does not deteriorate; it lasts a lifetime?

HYPOSPRAY

Colonel WOOD. It lasts a lifetime; yes, sir. There is no deterioration at all. Colonel Knoblauch has a hypospray which I believe he would like to show you.

This was developed, this particular model, to give injections right in the theater, up forward with the units, just pulled back of the line. Sterility is a considerable problem when you have very large numbers of men to vaccinate.

A new model, a modification of this, with an electric pump, is being developed for such places as induction and processing stations where many hundreds or thousands of vaccinations must be given.

It saves a great deal of time and materials and the sterilization of needles and syringes, and so forth.

This, as you can see, blasts the material right through the skin without any form of a needle whatever.

Colonel KNOBLAUCH. This particular one is set for 1 cubic centimeter. It regulates the dosage.

Mr. FLOOD. Is that pumped by air or by cartridge?

Colonel WOOD. Air pump; yes, sir. The air is drawn in here and there is a little filter in this needle, as you can see.

Mr. FLOOD. What is the liquid in the glass container?

Colonel KNOBLAUCH. Water, in here.

Colonel WOOD. The vaccines of the various kinds that are used would replace the water in actual use.

General MARIS. It is placed right against the skin; is it not?

Colonel WOOD. Yes. You wipe the skin off with alcohol and then you use this.

Mr. FLOOD. And then the patient is vaccinated?

Colonel WOOD. Then he has got it and it is all in under his skin.

Mr. FLOOD. This could be used, if necessary, for mass vaccinations?

Colonel WOOD. Yes, any mass vaccinations.

Mr. FLOOD. Has it been so used?

Colonel KNOBLAUCH. Not yet, sir.

Colonel WOOD. It is just ready now to go out.

Mr. RILEY. Could it be used as a local anesthetic?

Colonel WOOD. It could be used for anything that you wanted to inject through the skin.

Mr. FLOOD. How much is it going to cost for each unit?

Colonel WOOD. I do not have a price on it yet. We have to do some figuring with industry before we will know that. We intend to have just a few trial models, put them out at key places and let them gain experience with them. They may find faults with this and it may need modification.

Mr. FLOOD. In vaccinations today, whether mass or otherwise, you still use the old-fashioned needle process?

Colonel WOOD. Yes, sir.

Mr. FLOOD. This is the first progressive development from that?

Colonel WOOD. It is the first radical departure. We do have disposable syringes, which you do not have to sterilize, but dispose of them, throw them away, after one injection.

Mr. FLOOD. What would be the problem here after you get this in operation?

Colonel WOOD. We do not know of anything right now. Only trial and experience will bring that out.

Mr. FLOOD. Can this be used by corpsmen or must it be used by a medical officer?

Colonel WOOD. No; corpsmen could use it. It is simple enough. Anybody can use it.

VACCINE PROBLEMS

Mr. FLOOD. There has always been a fear of vaccine in the mind of the general public, whether right or wrong. In recent years that has been abolished pretty much by education, I suppose?

Colonel WOOD. I think it has, in this country.

Mr. FLOOD. But we have had some very bad stories that have come out from time to time perhaps unavoidable, of deaths, disfigurement, total disability, from the use of sour vaccines. Is that a problem now; was it a problem in the last war, or were they just isolated instances of various kinds?

Colonel WOOD. I am not even acquainted with the incidents that you speak of. Perhaps they occurred, but I do not know about them.

Mr. FLOOD. Oh, yes. Ill effects resulted, of all sorts, from bad vaccines, spoiled vaccines, sour vaccines—whatever you call them.

Colonel WOOD. There is a definite hazard, of course, to any procedure that is surgical, of this type.

Mr. FLOOD. I know of two cases in my own district of men who have been destroyed physically because of a vaccination at the cantonment upon their arrival. This was during World War II, and, in fact, halfway through it. But it is no scandal, it is no major problem, it is not anything to be afraid of and there is no record which indicates that it ever was; is that correct?

Colonel WOOD. The incidence of neuro-tropic reaction to smallpox vaccinations is one in 300,000.

Mr. FLOOD. Well, I do not mean that.

Colonel WOOD. That is, out of 300,000, one man is going to get the neuro-tropic type of smallpox.

Mr. FLOOD. That you cannot do anything about.

Colonel WOOD. That is correct.

Mr. FLOOD. But you can do something, if it is necessary?

Colonel WOOD. I think I know the incident of which you speak, which was a serious one. That was a hepatitis virus. It was in the

yellow-fever vaccine, in certain lots of it. We produced a great deal of hepatitis with that vaccine. The Rockefeller Institute produced the vaccine, and somehow or other by accident in certain lots of that, the hepatitis virus, the same one that is in plasma, got into this virus, and we had a great many cases of hepatitis resulting from that; but those were identified, the cause was found out quickly, and it was all stopped, and the vaccine was cleaned up. And we had no further difficulty with it.

Mr. FLOOD. But this kind of problem is so rare as to be negligible, even among 13 million men over a period of 5 years?

Colonel WOOD. I think that is a reasonable statement; yes, sir.

Mr. FLOOD. It is important because of the public attitude toward mass vaccination.

Mr. RILEY. Is this purely an Army development, Colonel?

Colonel WOOD. This is an Army development. It was developed in the Army Medical Service graduate school at Walter Reed Hospital.

General MARIS. Mr. Chairman, it is brand new. I showed it at the Pentagon at a luncheon today of the chiefs of the technical services for the first time.

FIRST-AID TREATMENT

Mr. FLOOD. What about the use of sulfa for the combat soldier in a foxhole, with an open wound?

Colonel WOOD. No.

Mr. FLOOD. What does he carry? What are the instructions for that?

Colonel WOOD. He carries a first-aid dressing only. The aid man carries the drugs; but we give him penicillin now, and, of course, at the aid station itself he can get——

Mr. FLOOD. A man goes on patrol, let us say. He is hit. There is an open slash in his arm, or he has an open body wound. What does he do with the open wound? Does he put anything in it?

Colonel WOOD. No.

Mr. FLOOD. Does he have anything in his kit to put in it?

Colonel WOOD. He has his own battle dressing, that is all.

Mr. FLOOD. What is that?

Colonel WOOD. It is in a little tin can about this size that opens up. He puts the dressing on and ties the four tails around him.

Mr. FLOOD. But there is no medication that he applies?

Colonel WOOD. No, sir.

Mr. FLOOD. He does not dust a packet of sulfa powder into the open wound?

Colonel WOOD. No, sir; that is considered bad practice now.

Mr. FLOOD. What about morphine or any antipain soporifics of any kind?

Colonel WOOD. The aid man has morphine syrettes with him.

Mr. FLOOD. What does the soldier have?

Colonel WOOD. He has nothing like that.

Mr. FLOOD. Why not?

Colonel WOOD. Because the aid man is right with him. He goes over the top with the infantry troops, along with them.

Mr. FLOOD. But what if a patrol goes out, let us say in the Korean theater—you know the kind of terrain they have there—and the aid

man is too far away. If he is 10 feet away he may be too far away. They should not all have to be heroes to save these wounded men. Is it advisable or necessary in your opinion, that the individual soldier have any kind of drug in his first-aid kit?

Colonel Wood. No, sir; I think that is very inadvisable, because it will be misused more often than it is used properly. With the modern array of antibiotics that we have, the infection problem is not important any more. We can take care of the infection even after it develops. And they have penicillin with the first aid that gets to him immediately.

DESCRIPTION OF MEDICAL TREATMENT IN A COMBAT SITUATION

Mr. Flood. This may not be a research and development problem, but let us get it in the record. What happens as soon as a soldier goes on patrol? He is one of a small patrol, let us say one of a dozen men, going out at night into enemy territory. The man is wounded in some way—through striking a mine, or he trips and falls—what happens to that man in the normal situation?

Colonel Wood. It depends upon the size of the patrol; but any sizable patrol, above the squad level, they will have an aid man along with them. He will have his own first-aid packet which he carries and, as a matter of fact, he generally stuffs additional items in his shirt, which he thinks may be needed. He renders first aid to that man, every man he can keep up with and who he knows is injured. He goes to him and renders first aid immediately.

Mr. Flood. Suppose only the one man is wounded and the aid man comes to him. He takes care of him. Now, what happens?

Colonel Wood. He puts him in a place which is protected from enemy fire and he leaves him there and accompanies the rest of the patrol. Then he comes back and picks him up and brings him back. They bring him back.

Mr. Flood. Who do you mean by they?

Colonel Wood. The patrol itself. They take turns carrying him out.

Mr. Flood. What happens, then, when you get him back to the lines?

Colonel Wood. He goes to the aid station.

Mr. Flood. This is a disabling wound now, this is not an ambulatory wound.

Colonel Wood. He goes into the battalion aid station.

Mr. Flood. How does he get there from the line?

Colonel Wood. In an ordinary combat litter. The litter bearers will bring him back. On the battlefield, the aid man will mark casualties in a way which can be seen by the litter bearers and they go immediately to those casualties and get them out and haul them back to the aid station. They carry them on litters. That is the usual method.

Mr. Flood. And then there is motor transport to the field station?

Colonel Wood. Usually, if they can use motor transport, yes. Otherwise it is again done by litter to the collecting station and from there they would use motor transport.

Mr. Flood. In the case of a bad abdominal or head wound, how soon will that receive other than field treatment?

USE OF HELICOPTER FOR CASUALTY TRANSPORT

Colonel WOOD. We are getting them out, a great many of them, by air—by the use of light planes and helicopters, particularly in Korea. Once they have gotten them out, we take them to the station which has attached to it a MASH unit—that is mobile Army surgical hospital, where he can reecive definitive surgical treatment to make him transportable from there by air.

Mr. FLOOD. Has Research and Development had anything to do with the money that was given for these helicopters or helicopter-ambulances?

Colonel WOOD. Yes, sir; we developed them with the Air Force, or adapted litters to them.

Mr. FLOOD. They are unquestionably practical?

Colonel WOOD. They are used every day in Korea.

Mr. FLOOD. But I suppose you are still working on them?

Colonel WOOD. Yes.

Mr. FLOOD. There is a great future in them even now?

Colonel WOOD. We have already adapted the smallest helicopter to two litters and the larger ones, which can take the patients inside of the cabin may hold up to 6 or 8 cases. But we have not used the larger helicopters routinely in Korea, only the small ones.

USE OF ADDICTING DRUGS

Mr. FLOOD. Have you had any incidence of drug addiction from the free usage of soporifics anywhere in the world.

Colonel WOOD. Not that I know of; no, sir. It is a rare problem with us. Occasionally we have heard of a doctor or an attendant that would become a morphine addict. But it is very rare.

Mr. FLOOD. Do you have a copy of your field medical kit for the average soldier?

Colonel WOOD. I do not have one here.

Mr. FLOOD. Was that developed in R. and D.?

Colonel WOOD. Yes.

Mr. FLOOD. Is that one of your products?

Colonel WOOD. Yes, sir.

Mr. FLOOD. What is this new syringe for morphine that the aid man has? Do you have a new kit for that kind of application?

Colonel WOOD. For morphine we are using the syrette, which is the same as that used in World War II.

Mr. FLOOD. Is morphine in the past now, is that out of the picture? Why do you still hang onto morphine?

Colonel WOOD. Because we have 8 million of them in the warehouses.

Mr. FLOOD. Is that a good reason?

Colonel WOOD. It is perfectly good morphine. We have developed two products, methadon and L-iso-methadon which have both been proved in the general hospital and in our own hospitals and in the Tokyo general hospital and at the Hung Nam beachhead to be satisfactory, a satisfactory equivalent, milligram for milligram, to morphine in general relief properties. They are, as a matter of fact, no different from morphine. This material can be made synthetically in this country from simple materials in great quantity.

Mr. FLOOD. You are not depriving our troops of the use of the best available product just because you happen to have a lot of morphine lying around?

Colonel WOOD. No. If Methadon or L-iso-methadon had some peculiar properties that made it better than morphine, we would use it instead.

Mr. FLOOD. But it does not have?

Colonel WOOD. It does not have. It acts exactly like morphine, produces the same symptoms and gives the same relief, milligram for milligram, that morphine does.

Mr. FLOOD. Will it also produce addiction if abused?

Colonel WOOD. So far as I know, the addiction properties are the same.

RESEARCH ON ATOMIC ATTACK WOUNDS

Mr. RILEY. Are you doing any research work in the cure of wounds caused by atomic attacks?

Colonel WOOD. Yes, sir; a great deal.

Mr. RILEY. Are you doing that on your own or for the Atomic Energy Commission?

Colonel WOOD. We are doing it on our own but in collaboration with the Atomic Energy Commission and with the other services. We have a joint committee.

Mr. RILEY. Does the Atomic Energy Commission have a research laboratory?

Colonel WOOD. They have a very large research program; yes, sir. Theirs is larger than the medical programs of the three services combined.

Mr. RILEY. Are they restricted just to one mission, one program?

Colonel WOOD. They have quite a variety of things. The first part of their program concerns the safety of people working in plants—safety work. In that they have to determine the toxic hazards of all the materials that they deal with, as well as the radiation hazards of all their materials. Another part of their program concerns the treatment of radiation injuries whether caused by external or internal radioactive compounds.

Mr. RILEY. Does the Public Health Service also have such a program of the cure of injuries from atomic effects?

Colonel WOOD. To a limited extent. Their program is rather limited in that field. It is mostly the Atomic Energy Commission and, to a much lesser extent, that of the armed services.

Mr. RILEY. Did I understand you to say that the three branches of the armed services are conducting experiments on atomic injuries, for their cure?

Colonel WOOD. All three are doing some parts of the work.

Mr. RILEY. Is that a sound program, this duplication by the services?

Colonel WOOD. I think there is very little duplication there, sir. For example, the Navy laboratories are studying the internal hazards of breathing in of radio-active materials. Neither the Army nor the Air Force are touching that. That is left wholly to the Navy. We are studying the treatment of the effects of gamma radiation. The Navy is not touching that. The Air Force is studying the matter only

from the standpoint of the safety of pilots who are going to fly certain types of aircraft.

I think we probably overlap less in that field than in almost any other and we are all well acquainted with what the other is doing.

Mr. RILEY. In other words, the Navy and the Air Force are also anticipating and working on the development of ways of curing the effects of any atomic injuries?

Colonel WOOD. That is correct.

(Off the record.)

RESEARCH ON TREATMENT OF BURNS AND OTHER WOUNDS

Mr. RILEY. What progress are you making in your program to treat such injuries as burns and other wounds?

Colonel WOOD. We are making a great deal of progress with the burns. Of course, as you know, the burn is one of the most frequent and important types of injury caused by atomic explosion. We are making a great deal of progress with that and have within the past 2 years—mostly within the past year. We have, I think, reduced the mortality of burns of more than 20 percent of the body surface; full-thickness burns, all the way through the skin, we have reduced those by 50 percent. Formerly a man with a 20-percent burn was considered a dangerous case, a critically ill case. We do not regard them so any more. We save them routinely.

We regard a critical case now as that of a man with more than 50-percent burn, which indicates very real progress has been made in the management of that phase, the shock phase of the burn, which occurs in the first 36 hours. But you are really in danger for about 3 or 4 days altogether. It is critical in the first 36 hours which, I think, has been completely solved, has been solved in such manner that you can give rules of thumb now to the average practitioner, where he may be expected to take care of 20-percent burns and even worse without any serious difficulty.

The matter has been laid down in such simple rules that the average practitioner can take care of the major burns whereas before it was not very advisable.

Mr. RILEY. That is very gratifying, of course.

Mr. Flood, have you any other questions?

Mr. FLOOD. None, except I would like to say that I have been very much impressed by the scope of information and knowledge exhibited by this witness and the effective method of his presentation.

Colonel WOOD. Thank you, sir.

Mr. RILEY. And I want to add that I concur in that. I think it has been a very fine presentation, Colonel.

Colonel WOOD. Thank you, sir.

Mr. FLOOD. By the way, Colonel, what is your job?

Colonel WOOD. I am Chairman of the Medical Research and Development Board of the Surgeon General's office.

Mr. FLOOD. How long have you been on this job?

Colonel WOOD. A year and a half, sir.

Mr. FLOOD. You are a professional soldier, of course?

Colonel WOOD. Yes, sir; a medical officer.

Mr. RILEY. Thank you, gentlemen.

Quartermaster Corps Research and Development

General Maris. Mr. Chairman, we are ready to proceed with the Quartermaster's part of research and development, and I should like to present Col. T. R. J. Hickey of the Office of the Chief of Quartermaster Corps.

Mr. Riley. Colonel Hickey, we are delighted to have you here and will be glad to have your statement.

Colonel Hickey. Requirements for the Quartermaster Corps total $9.6 million as compared with $10 million for 1952 and $7.3 million for 1951. The funds requested for 1953 will provide for continuation of program acceleration already attained within the over-all objective of the Quartermaster Corps of keeping our most critical commodity, trained combat forces, "fit to fight." This is done by finding out how to protect these irreplaceable assets from the climatic environments of the world and by providing functional food, clothing, and personal equipment, at a minimum cost to the taxpayer.

The quartermaster requirements are shown by budget activity on this chart, with the comparable amounts for the two preceding years. I would like to discuss these requirements, touching briefly on each individual area of activity.

Quartermaster research on airborne landing and amphibious operations: Fiscal year 1951, $1.8 million; fiscal year 1952, $2.4 million; fiscal year 1953, $2.1 million.

This activity covers the development of new parachutes and associated droppable equipment for use in aerial delivery of supplies and equipment. Equipment recently standardized has aided the QM Aerial Supply Company in its delivery up to September 1951 of 20,000 tons of material by air drop to combat troops in Korea.

Fund requirements under this activity also include materials handling equipment, tentage, laundries and fuel-handling equipment. Equipment for the mechanized loading of supplies into cargo aircraft has been developed and will undergo tests in the near future. Improved models of commercial handling equipment are being evaluated for Army warehouse usage.

New medical tents, shelters, and lightweight 10-man-troop tents for cold weather usage are now under test. Reduction of weight and conservation of tentage materials loom high in future programs.

Economically important standardization of containers for QM usage have been made. Improved fiberboard drums, wire-bound containers, and wooden crates have increased the protection afforded many items in overseas shipment. A new free-fall container for gasoline and other liquids has passed preliminary testing.

We are prepared to show this item to you now.

Gasoline Drop Container

Mr. Blake. My name is Blake, Mr. Chairman. I am with the Research and Development Division in the Office of the Quartermaster General.

This container here was developed primarily to drop gasoline out of aircraft, without using parachutes of any kind.

It can also be used for water or other liquids. It is made out of about half synthetic rubber and, so far, half natural rubber.

It has been dropped from altitudes of from 200 to 2,000 feet at speeds up to 150 miles an hour, without failure.

This one right here was dropped at an altitude of 200 feet and then again at 800 feet on a concrete runway, without failure.

We think it has great possibilities. We are still working on it. It needs to have some work done on this closure [indicating].

To show you how you might save some money, if this thing is fully successful—I believe Colonel Hickey mentioned there that about 20,000 tons of material have been dropped in Korea up to 5 April 1951. In any supply operation it is usual that about 50 percent and sometimes eeven more of the weight is liquids—fuels, lubricating oil, water.

In order to drop let us say 750 gallons of gasoline—that is, 40 pounds per can—you would require two G–12 parachutes which cost $3,500. You would require a drop platform that costs about $500. You would require the cans which would be worth around $300. The total would be about $4,200. This container we think we can make for $10 or less.

Mr. RILEY. What is the capacity of that container?

Mr. BLAKE. It is 5 gallons. That is, we use 5 gallons in it, but it can hold 9. But, in order to give it the proper aerodynamic shape, when it falls, we keep it down to 5 gallons.

Mr. FLOOD. Are you doing anything to make that 100 percent out of synthetics?

Mr. BLAKE. We are. We think finally it will be 100 percent synthetics.

Mr. FLOOD. I hope it is.

Mr. BLAKE. Now, compare that cost, $1,500 for the same drop which now costs $4,200. We would be saving about $2,800 per drop. Now, a little mathematics here: take half of the 20,000 tons, 10,000 tons, divide that by 3, which is a 3-ton load, which is the equipment that I gave you, times the saving of $2,800, and it comes out to something like $9,400,000 might have been saved in the delivery of materials to the ground troops.

Of course, that is pretty idealistic. But it is a possibility, if this thing works as we hope it will.

Mr. RILEY. That estimate is based on what amount of droppage—that saving?

Mr. BLAKE. You would have 10,000 tons.

Mr. RILEY. And on 10,000 tons you would save $9 million?

Mr. BLAKE. You would save $9 million, if we did not have to use parachutes.

Mr. FLOOD. Under what circumstances is it necessary to go to this length to supply what kind of troops with any sizable amount of gasoline? Why should this be such a great, extensive program? Are you contemplating operations behind the enemy lines with sizable units dropped by air, whom you will have to supply by air? Why is this such a great problem? Where is there going to be such a large operation?

Mr. BLAKE. Sir, they have already dropped 20,000 tons to troops in Korea, which is really a comparatively small operation.

Mr. FLOOD. This is gasoline?

Mr. BLAKE. Altogether; I said altogether.

Mr. FLOOD. You are talking now about dropping liquids, primarily gasoline, I suppose, because of the use of motorized transportation?

Mr. BLAKE. That is correct.

Mr. FLOOD. In remote mountain areas or in desert areas, if and when necessary, you would be dropping water, but that would be a remote case. It is primarily gasoline. Why is this presented as such a great money-saving project? Why should this be developed to such a vast extent?

Mr. BLAKE. I am not supposed to be in that business to decide what the operations are. But nearly all of our operations use a considerable amount of air transport, which drops supplies to troops, particularly if they get out and away from the main body, or they get surrounded by the enemy, and so forth.

Mr. FLOOD. In other words, any air drop must include liquids?

Mr. BLAKE. Yes, sir.

Mr. FLOOD. And if it includes liquids, it is almost invariably gas?

Mr. BLAKE. Yes, sir.

Mr. FLOOD. And hence, this is as essential as any other kind of package that you have to drop?

Mr. BLAKE. Yes, sir; very much so.

Mr. RILEY. You would have less damage and less spoilage with this container than you would in the use of cans, even with parachutes, would you not?

Mr. BLAKE. Yes, sir. As a matter of fact, we have developed this so that every one of these trucks and jeeps and tanks and armored vehicles has in it a flexible tube nozzle—that is used with the 5-gallon can now—and that same nozzle will fit right in here [indicating on model] and they are using it to empty this container.

Another thing, this is much easier to collect. It is not subject so much to pilferage as parachute equipment is.

Mr. RILEY. You cannot break it open, or it does not break easily when it drops?

Mr. BLAKE. With parachutes I would say that loss would be approximately 10 percent at least, speaking of 5-gallon cans.

Mr. RILEY. So you would save that with the use of this container?

Mr. FLOOD. Leaving aside the use of this as an air drop, for the moment, and taking into consideration the fact that tin is a foreign-source material, and is used in the manufacture of cans for the transport of gas for our Armed Forces and for many other things, why should not this, if it is to be 100-percent synthetic material, be substituted for all tin cans?

Mr. BLAKE. Even with 100-percent synthetic, this will cost probably three to four times as much as a gas can such as we have now. And, by the way, there is not much tin in them.

Mr. FLOOD. Even as a synthetic, the cost would be——

Mr. BLAKE. For a normal operation.

Mr. FLOOD. Three or four times as much. So, it would not be advisable to develop this as a substitute for the ordinary container?

Mr. BLAKE. But it could be used.

Mr. FLOOD. But it is not economical?

Mr. BLAKE. I do not think so; no, sir, for general use.

Mr. RILEY. You may proceed, Colonel.

Colonel HICKEY. Emphasis is being placed on reducing the types of containers required and the enhancing of their durability against the effects of low temperature and moisture. Improved mobile laundries are under test which, in addition to providing laundry and dry-cleaning service, can apply insecticides, fungicides, flame proofing and

Chemical Corps impregnations. This same equipment will be used to decontaminate in the field.

Equipment already standardized for handling fuels and lubricants has increased the delivery capacity for the petroleum-supply companies in Korea by at least 100 percent.

The next item: Quartermaster research on personnel, intelligence, and planning operations: Fiscal year 1951, $3.8 million; fiscal year 1952, $5.5 million; fiscal year 1953, $4.5 million.

This activity provides for research and development on subsistence, cooking equipment, body armor, clothing and other items, as well as quartermaster work on the determination of environmental stress areas of the world.

Mr. RILEY. Is this new plastic vest a development of the Quartermaster?

Colonel HICKEY. The vest we have is a development of the Quartermaster; yes, sir. We have it outside to show you, if you wish.

The Department of Defense assignment for research and development in subsistence will be aggressively pursued with special emphasis on improved acceptance, and stability in foods.

Mr. FLOOD. What does that mean, "improved acceptance"?

Colonel HICKEY. Just exactly that.

Mr. FLOOD. Who accepts what?

Colonel HICKEY. The soldier accepts it. If he does not eat there is a great loss. Important problems relate to sterilization methods, space-saving, packing, usable and palatable dehydrated products, and a universal survival ration.

NEW ONE-BURNER STOVE

As has been mentioned, an initial procurement of a new one-burner stove saved $615,000 over the old model, reflecting improved design and less critical materials. We have a model of this stove to show you at this time.

Mr. MILLARD. I am Mr. Millard. I am research director of the Mechanical Products Branch of the Research and Development Division, Office of the Quartermaster General.

That is a one-burner stove that burns leaded gasoline that is issued to airborne troops, mountain troops, tanks, truck crews, and other people who are waiting for an organized mess.

This one here [indicating] was used in World War II. It is made of stainless steel and cost current prices between $9.25 and $9.50.

This stove is the result of development and is now being used in Korea and costs between $4.44 and $4.67. I think it is fairly obvious that this is a much more complicated design, calling for complicated tooling. It is made out of 18–8 steel, which contains a lot of nickel.

This is a simpler stove, made of carbon steel; no chromium, no nickel bar steel. There is 30 percent less brass in this new stove.

This is the same size and the same weight as the old stove and has nearly 60 percent greater capacity.

Mr. RILEY. The fuel that you use is the same as you use in motor vehicles?

Mr. MILLARD. Yes, sir; leaded gasoline.

Mr. FLOOD. This has increased the consumption of gasoline in the Armed Forces; is that right?

Mr. MILLARD. I am not familiar with those figures.

Mr. FLOOD. It is indicated here that the procurement of a new one-burner stove saves $615,000 over the old model. How would it save $615,000 at the end of the line? Is this Army saving or is it Appropriations Committee saving?

Mr. MILLARD. That figure represents last year's cost for the procurement of that item.

Mr. FLOOD. Of course, when you turn a stove or anything else over to a soldier, he is not necessarily going to use it for what you tell him to use it?

Colonel HICKEY. That is right.

Mr. FLOOD. It has been indicated that the additional consumption of gas would be 1 gallon of gas per man per day. Have you ever heard that said?

Colonel HICKEY. Not that figure; no, sir. I have not. I have heard of increased consumption; yes, sir.

Mr. FLOOD. You do not know then whether that would cancel out your saving in actual dollars?

Colonel HICKEY. No, sir.

Mr. FLOOD. Through increased fuel consumption?

Colonel HICKEY. Obviously it would, if that were the case.

Mr. FLOOD. That is, if it were so.

Colonel HICKEY. Yes, sir

Mr. FLOOD. But your position is, even though it does, the service to the troops in the field is so great, the convenience to them is so superior, that even without the dollar saving, as a heating and a cooking instrument for the general well-being of the troops in the field in those categories that this witness mentioned, it is still desirable. Is that it?

Colonel HICKEY. It is still desirable. Also, our position is this: That, from our point of view, we have a stated requirement for this item. We are told the item is needed. What we have done is to make it as inexpensive as possible so that it will use as little as possible of critical materials.

Mr. RILEY. Both of these stoves use the same material for fuel?

Colonel HICKEY. The same fuel; yes, sir.

Mr. FLOOD. Have you any statement to make on the fuel consumption of one unit per man per day in a normal operation?

Colonel HICKEY. The new stove is 60 percent more efficient.

Mr. FLOOD. It is more economical in the consumption of fuel?

Colonel HICKEY. It turns out the same heat with less fuel, either way you want to put it. It is 60 percent more efficient.

Mr. FLOOD. So that even though there were additional gas consumption, it indicates a much wider acceptance and utility in this new instrument?

Colonel HICKEY. That is true.

Mr. FLOOD. Now, is it true? I asked a very leading question. I am just making a very good witness for the Army. Is it so? Have you heard? Do your investigations or evaluations indicate that that is true?

Colonel HICKEY. I thought you were asking whether it is truly more efficient.

Mr. FLOOD. Is it more efficient?

Colonel HICKEY. It is more efficient.

Mr. FLOOD. Has it been operational? Has it been in service?

Colonel HICKEY. It is operational, it is in service.

Mr. FLOOD. And you have had an opportunity to evaluate its results as compared to the old stove used for the same purpose or issued for the same purpose?

Colonel HICKEY. That is right.

Mr. FLOOD. And what is the result of your evaluating process?

Colonel HICKEY. A validation of its greater efficiency according to observers' reports.

Mr. FLOOD. You are referring now to a 60-percent increase in efficiency, in heating utility?

Colonel HICKEY. That is right.

Mr. MILLARD. If you will notice in that stove that you have in front of you, the valve is on your right facing away from you. That valve is much more easily operated especially under low temperatures. This one was designed and we redesigned them for use in cold temperatures where it would be much more difficult to operate.

Mr. RILEY. This one has some adjustments on it?

Mr. MILLARD. That is to clean the orifice, because when you burn leaded gasoline, it makes a deposit. This has to be wiggled in order to clean it.

Mr. FLOOD. What about the weight of this material?

Mr. MILLARD. It is carried on the back. It weighs 22 ounces—in both cases the weight is the same; but we have gotten a greater capacity with the same weight.

Mr. FLOOD. What sort of a container is that put in?

Mr. MILLARD. It is in an aluminum top which can be used.

Mr. FLOOD. It can be used as a cooking instrument?

Mr. MILLARD. Yes, sir.

Mr. FLOOD. In other words, the container in which this stove is transported on the back of the individual soldier can be utilized by the soldier as a heating container, as a soup bowl or a cooking utensil so that he can heat something in it, some liquid?

Mr. MILLARD. Yes, sir; except because of the fact that this is gasoline I doubt very much that anyone would want to cook loose soup in it. This would be used for cooking the field ration, heating the can. They put the can inside this and it heats the material in the can.

Mr. FLOOD. But there is a utility in the field in the container itself?

Mr. MILLARD. Yes, sir. We have tried to make the whole thing utilitarian. We have spares with all the different parts and we have tried to make sure first that it could be used in the field.

General MARIS. One of the major savings in this is in the matter of nickel, which is one of our most critical materials.

WEDNESDAY, MARCH 5, 1952.

Mr. RILEY. Colonel Hickey, you had not completed your general statement. Will you proceed, please?

Colonel HICKEY. Mr. Chairman, with your permission I would like to make a statement at this point clarifying some of the testimony given late yesterday.

Mr. RILEY. Very well.

Colonel HICKEY. The stove, cooking, gasoline (1-burner stove) presently in use in Korea has a fuel capacity of 14 ounces (0.875 pints); 5.96 ounces per hour are consumed to give a maximum output of 5,500

B. t. u. per hour. This means that the stove under maximum output will burn approximately 2.36 hours, or almost 2½ hours.

In our testing of these stoves, it was found that it required 29.5 minutes to heat a can of beans (temperature of beans 64 F.) in an ambient temperature of 70 F. to a final temperature of 140 F. Under this condition 2.9 ounces of fuel were used. When four cans of beans (temperature of beans 68 F.) were heated to a final temperature of 140 F. in an ambient temperature of 72 F., it required 30.8 minutes and utilized 3.06 ounces of fuel.

Approximately 4½ meals (consisting of four cans of beans or its equivalent) could be prepared on one filling of the tank. (14 ounces divided by 3.06 equals 4.6). It is certainly conservative to say that three meals per day can be prepared with one filling of the tank.

It should be emphasized that this stove is not an item of general issue. It is issued only to airborne troops, mountain troops, tank crews, truck crews, and similar people who are by the nature of their duties separated from a regularly constituted mess in order that they may have hot meals. These meals will, of necessity in most cases, be C rations.

One further thought—gasoline for fuel is the most easily transportable and the most easily distributed of all the fuels, which is why gasoline is used. It should be further kept in mind that in cold climates, where these stoves are used to a great extent, hot meals are essential.

Mr. RILEY. About how much is that in terms of gallons—you referred to 3.6 ounces?

Colonel HICKEY. The fuel capacity, the total of the tank is seven-eighths of a pint, which would handle or which would be sufficient to prepare three meals.

Mr. RILEY. Seven-eighths of a pint would take care of three meals in a day. I can very readily see the necessity for using gasoline—at least the feasibility of it—because you do not have to have separate containers and separate distribution. It all comes out of the same fuel tank?

Colonel HICKEY. That is right.

Mr. RILEY. Which would represent a savings in itself.

BODY ARMOR

Colonel HICKEY. Continuing with my general statement:

An analysis of wound distribution made by the Surgeon General's office in Korea clarified the possibilities of and need for protecting vital organs from low-velocity missiles. An 8-pound, nylon-body armor designed for this purpose shows considerable promise. One thousand five hundred sets are now being procured for combat testing in Korea. Fifty of these have already been shipped. We have a model here to show to you.

Mr. GARDNER. Gentlemen, my name is Charles Gardner. I am a plastic technologist, in the Chemical and Plastics Branch, Research and Development Division, Office of the Quartermaster.

This is an experimental model of an armored vest which is currently being battle-tested in Korea.

This vest represents the culmination of research on an Army-wide basis by a number of organizations, including participation by the

Ordnance Corps, the Chemical Corps, the Office of the Surgeon General, and the Quartermaster Corps.

As a matter of fact, the team which is presently in Korea, charged with supervising the testing of this item, is under the direction of the Quartermaster Corps but, in addition, has personnel from the other groups that I have mentioned.

It is an inescapable fact that it is impossible so to armor an individual soldier as to protect him from every type of projectile and missile. However, what we have done here is based upon the idea that it is possible to effect a significant savings in life by protecting the vital organs, from the shoulder to the waist, while at the same time maintaining the weight within tolerable limits so as to minimize interference with a combat soldier's mission while on the battlefield.

I would like to show you some samples, gentlemen, of what this material is made of.

Mr. RILEY. Does the soldier have absolute freedom of body movement?

Mr. GARDNER. He does not have absolute freedom, but this is the minimum interference while at the same time giving him the maximum of protection for that particular weight.

What we are trying to do here is to protect the vital organs from the bulk of fragments which are likely to strike that particular area.

We know that 70 percent of the combat casualties are occasioned because of fragmentation from shells, grenades, and the like. This is designed to stop low-velocity fragments, the bulk of the fragments.

Those samples indicate the composition of the vest. It is multiple-layer nylon fabric which has been bonded in triangles, supported in the back with rubber to pad the shoulders and the lower ribs, so as to minimize the possibility of fractures.

The combat team which is presently in Korea is actually conducting a preliminary survey and among its personnel there are five highly qualified medical officers who have joined the team as a wound ballistics research section. They are advising us as to the next steps to be taken so far as coverage of the jacket is concerned and whether or not the item as it is presently constituted is affording adequate protection to the combat soldier. Also they will comment upon its general utility as well as its comfort.

Mr. RILEY. Why do you have these checkered holes in this rubber lining?

Mr. GARDNER. That is to reduce the weight, sir. There is a weight limitation imposed upon us by the using agencies. They would like us to keep this jacket down to 8 pounds or under. That is an attempt to minimize the weight.

Mr. RILEY. What is the purpose of this rubber?

Mr. GARDNER. The rubber is to pad the shoulders and the lower ribs so as to minimize the possibility of fractures.

Mr. RILEY. To protect against mechanical shock?

Mr. GARDNER. That is correct. There is some indentation, naturally, under some circumstances and that rubber absorbs some of that shock.

Mr. RILEY. This is not bullet-resistant material, is it?

Mr. GARDNER. It is not bullet-resistant. It is designed to prevent 70 percent of the casualties which are produced from fragments. That is what its job is. Actually we do not say it is a bullet-proof

vest. But it is a bullet-resisting vest, but it is not designed for that purpose.

Mr. SCRIVNER. Is this for general issue or is it given only to special details?

Mr. GARDNER. It is designed for general issue.

Mr. RILEY. Is this the same kind of vest that the Marines have been using?

Mr. GARDNER. No, sir; it is a different vest. The Marine Corps vest, which was developed by an assist from the Quartermaster Corps—as a matter of fact, the Quartermaster Corps did the original work on the general type of the vest—is composed of flat plastic plates. We have a sample here that I can show you.

These flat plastic plates are designed to overlap. Actually, this particular section does not overlap; some do and some do not.

One thing we are not particularly keen about is that these plates butt together. When they do not overlap, this is a very vulnerable area for the penetration of a fragment.

Our particular item has approximately 60 percent more coverage than the Marine Corps vest with no increase in weight. In addition to that, that Marine vest is a rather rigid item and what we have here is a flexible item.

Mr. RILEY. Have you had any experience to indicate the comparative value of these two vests, to show which is more effective in preventing casualties.

Mr. GARDNER. Our experience indicates that this vest is superior to the Marine Corps vest. When we discuss fragmentation, that is our laboratory experience in our limited field tests. However, we are conducting additional work at this present moment to compare them directly.

Mr. SCRIVNER. A good comparison would be defense against fragmentation and direct missle?

Mr. GARDNER. That actually will be the comparison, sir. But what we are concerned with is the fragmentation effect; that is, these low-velocity fragments which cause 70 percent of our combat casualties. That is what we are actually after because, in order to give us protection against these missles—in other words, for example, a .45-caliber bullet—it would be necessary so to increase the weight that the already overburdened foot soldier will not accept it. That has been one of the criticisms made of some of the earlier models.

Mr. SCRIVNER. I imagine there will be times when they are going to object to that one, too.

Mr. GARDNER. That is one of the purposes of the present survey team, to determine what objections they do have. Preliminary indications are that it is quite acceptable.

Mr. SCRIVNER. How much does this interfere with a man's use of his weapons—for instance, his rifle? When I put this on it seemed rather clumsy around the shoulders and rather tight under the armpits.

Mr. GARDNER. We have had a number of people who have had combat experience with this, as well as our field experience, and they indicate to us that this is the most comfortable armored vest that they have worn. And they say that it gives them the minimum of interference and enables them still to accomplish their battlefield mission.

Naturally, any vest, regardless what it is, is going to make for some interference. But we feel that this is the minimum.

I would like to show you, gentlemen, this flier's vest of World War II vintage. It weighed 17 pounds.

We have a vest here which gives 50 percent greater coverage and at the same time we reduced the weight to 8 pounds.

This is a vest which is presently in Korea. It is a World War II vest. You may have seen pictures of it in the newspapers; it is used by the ground forces. It weighs 12 pounds. Our vest weighs 8 pounds and gives us over 50 percent additional coverage.

In other words, where they get say 4½ square feet we get 6 square feet with this vest.

Indications that we have received from the field are to the effect that this standardized vest is too heavy, it interferes unduly with the mission of the soldier.

If I may, sir, I would like to show you some of our experimental data. This particular armored vest was exposed to hand grenades at a distance of 10 feet—regular Army standard fragmentation grenade. Before the firing this card was placed in front of the vest. The grenade was electrically detonated. The fragments struck as indicated on this card.

You will notice in the upper right a rather large fragment struck, whereas in the upper left a small one hit.

When we remove the card, we can observe where the fragments have actually impinged on the vest itself. We have not circled all of them, only the major hits.

This card was then withdrawn from the inside of the vest and you will observe that from all the penetrations which were received on the vest itself, there was only one perforation, one fragment which went all the way through. That is this one. As I indicated earlier, that is the only one that actually got through the vest.

I believe that you can see from this the value of an item of this type. This particular fragment which did get through undoubtedly was a high-velocity fragment. In order to protect against that we would have to build up our weight unduly.

Mr. SCRIVNER. When you say it got through, how far did it get through and how much injury would it have inflicted upon the wearer?

Mr. GARDNER. It did not go through the front of the vest. It is likely, from what the medical officers tell us, that the injury at this particular time would have been slight. Of course, it is difficult to predict where it will come. That is just by chance. But it slowed down that particular fragment so much that it is felt that the casualty would have been minor.

HELMET LINER

Perhaps you would like to take a look at this new helmet liner. This is a nylon helmet liner made by using essentially the same process we have here, except that it is a more rigid nylon.

This liner weighs approximately half that we are now using. We are now using the M–1 steel helmet with the phenolic canvas liner that is presently issued to the troops.

Here we have an item which is 10 percent better ballistically. When we add the new aluminum shell to that liner, we have an item which

is approximately 10 percent lighter in weight than we are now using and 50 percent better ballistically. That item is presently under test by the field forces and reports that we have received so far are to the effect that there have been no difficulties in getting favorable troop acceptability.

Mr. RILEY. About how much does that combination weigh?

Mr. GARDNER. Forty-six ounces. The present M–1 steel helmet plus its liner weighs approximately 50 ounces. In addition to that, we are getting away from the use of steel.

Mr. SCRIVNER. What will be the cost to produce this?

Mr. GARDNER. This assembly will cost approximately twice that of the present unit. However, research is under way in an attempt to effect economies by the exploration of additional materials, improved manufacturing techniques.

However, today this represents the best thinking of the Quartermaster Corps, insofar as ballistic protection to the soldier is concerned, and within the framework of the limitations under which we have to operate in order to present a suitable item to our users.

Mr. RILEY. Can you give us the present cost?

Mr. GARDNER. Of this item, sir?

Mr. RILEY. Yes.

Mr. GARDNER. There is a production estimate of $12.

Mr. RILEY. What about the cost of the vest?

Mr. GARDNER. We have a productoin estimate of $50.

Mr. RILEY. Thank you very much, Mr. Gardner.

NEW COLD CLIMATE CLOTHING

Colonel HICKEY. New cold climate clothing, based upon extensive research over several winters in Alaska and Canada, has been standardized and is now being procured for issue. It is more efficient than World War II cold climate clothing, and gives adequate protection to the soldier under cold-wet conditions, and by the addition of an extra garment, also in extreme cold.

An improved insulated combat boot has been developed and standardized by the QMC to replace the footwear previously worn under cold-wet conditions. This item has been provided to combat troops in Korea during this past winter. A team of technical experts has just returned from Korea, where they have been giving instructions on the fitting and use of this very promising development. The extension of the vapor barrier principle utilized in the QM insulated combat boot has made possible the development of extremely interesting body clothing, which may possibly replace several items of present cold climate clothing, with a considerable saving in cost and critical materials. Two hundred experimental vapor barrier suits have been procured and are being tested this winter in Korea, Alaska, Fort Churchill, and Fort Drum. We also have one of these to show you.

Mr. HENSCHEL. Mr. Chairman, I am Austin Henschel, Research Director of the Quartermaster Climatical Research Laboratory. We have several items of clothing here to show you. They are built on the vapor barrier principle, and they are to be used by the soldier in wet, cold environments.

The first item is the vapor barrier boot. This shows the construction of the boot. It consists of an outer rubber layer and an inner wool

layer of insulation, inside that, and another rubber layer, so that the insulation, the wool insulation, separates the two rubber parts. The outer rubber part keeps the water from penetrating from the outside and wetting the insulation. The inner rubber prevents the water that may come in over the top of the boot from wetting the insulation from the inside.

Occasionally an accident may happen and the outer rubber part may be snagged or cut, and water get in. Of course, when that happens, the insulation is lost and the warm effect of the boot is lost.

A recent development of a new item, polyvinyl chloride, a sponge plastic, will probably make it possible to substitute a nonwettable material for the wool in the boot.

This represents the proposed new type of boot, where we have this polyvinyl chloride, which is sponge. That is placed in between the two rubber layers, instead of the wool. In this way, even though the outside is ruptured, the material does not get wet and the individual's insulation remains dry and effective against the cold.

Mr. SCRIVNER. What is the comparative warmth value and insulating value of the wool as compared with this?

Mr. HENSCHEL. For equal thicknesses, the wool bat, like that is about the same as this—that is, for equal thicknesses.

Mr. SCRIVNER. What are the comparative complications in the manufacture and production of this polyvinyl material? Is it difficult to obtain or to produce?

Mr. HENSCHEL. The raw material is very plentiful.

Mr. SCRIVNER. What would be the comparative cost?

Dr. HUNTER. Forty cents a pound. There are about 40 million pounds of polyvinl chloride being produced in this country.

Mr. SCRIVNER. How does that compare to wool in the cost of this particular item?

Dr. HUNTER. We estimate that once production capacity is obtained to make this material it would take about $5 worth of that material in a suit.

Mr. SCRIVNER. Can you give me a rough idea of the comparative cost of the insulating material in this latter type as compared to the one which you first showed us?

Dr. HUNTER. I would say maybe it would cost twice as much as the raw material. But the point is that you have got an insurance factor here that you do not have in the wool.

Mr. SCRIVNER. What is going to be the comparative cost of manufacture, if you know?

Dr. HUNTER. I do not think we can answer that at the present time. We have not made enough experimental models.

Mr. SCRIVNER. I noticed that in your second model you have a different type of material in the sole of the boot?

Mr. HENSCHEL. That is the same material as this. It is not the wool, the felt, but it is a plastic, nonwettable sponge material.

Mr. SCRIVNER. Looking at the arch of the boot, which of these two materials would be most apt to give effective support, the new or the old?

Dr. HUNTER. The answer is that they are about equal. The boot will adjust itself internally to the same degree; in other words, it would support the arch about the same in both shoes.

Mr. SCRIVNER. Have you any figures to indicate the comparative final costs of the two?

Dr. HUNTER. The latest price, I believe, on the original model was around $17. Like all those things, the cost goes down as the production volume goes up and competition between manufacturers becomes keener.

Mr. SCRIVNER. What about the new model?

Dr. HUNTER. As I say, we can only estimate.

Mr. SCRIVNER. Give us an estimate, then, please.

Dr. HUNTER. It is not going to be more than 5 percent more, if that.

Mr. RILEY. What do your experiments show with regard to the absorption of perspiration in the foot?

Mr. HENSCHEL. You mean in one wearing the boot?

Mr. RILEY. Yes.

Mr. HENSCHEL. The foot gets wet in the boot, but you do not get an accumulation of sweat—that is, liquid water—in the boot. There is some process by which the total water accumulated in the sock reaches a maximum and then levels off.

Mr. RILEY. My experience with hunting boots, using rubber inside is, after you stop walking, the foot gets cold as a result of the perspiration. Do you find the same thing here?

Mr. HENSCHEL. No, we do not; because the insulation is better here and it does not get wet while in the normal hunting boot, your sock gets wet and you have no effective insulation left. You do in this.

Mr. SCRIVNER. We had an earlier presentation of this boot that is now under discussion and my recollection is that the estimated price given us at that time was different than the $17 price that you mention now.

General MARIS. I think originally it ran to about $24 or $25.

Mr. SCRIVNER. General Decker, do you remember what we were told then?

General DECKER. No, sir; I do not remember the exact figures that were given then.

Mr. SCRIVNER. I remember making some calculations on the basis of the figures that were given us. The general then told us about using the old boot with 3 or 4 pairs of ski socks, and figured that in on top of the original cost of the old boot. We had a comparison of the two, the new one using only one pair of socks, which brought the cost of the new one down to a fairly comparable figure.

General DECKER. I do not remember what the figures were that were given at that time.

Mr. HENSCHEL. We have extended the use of this polyvinyl chloride material into a suit to be worn in cold-weather conditions. This is the basic stock from which the suit is made. It is a flat stock with the buttons on the inside. The buttons are worn next to the skin, without any underwear. The buttons keep the flat stock away from the skin and allow air movement through so that one gets ventilation to keep one cool.

This material is covered by a cotton outer jacket for protection against snagging. The pants are made of the same material, again covered with a cotton fabric on the outside.

This material has certain very encouraging characteristics. One of the things is that the material is buoyant. A person wearing that suit cannot sink. We have some photographs here of a demonstration

that we made before a joint Army, Navy and Air Force group and it shows the people are lying flat in the water, are not sinkable.

Another characteristic of it is that it does not wet. You can put it in water, have water both outside and inside, but the material itself remains dry so that the insulation is effective.

Mr. SCRIVNER. How long have you been wearing this suit; how long have you had it on?

Mr. SLAUTA. I have had it on about an hour and a half, sir.

Mr. SCRIVNER. Does it cause much sweating?

Mr. SLAUTA. It will in this temperature; yes, sir.

Mr. SCRIVNER. Of course, this is a warm room.

Mr. SLAUTA. That is right, sir.

Mr. SCRIVNER. Even so, I have just felt your skin and while the skin does feel fairly warm, even under the armpits there is not an excessive amount of sweat.

Mr. SLAUTA. In the proper environment you can wear this.

Mr. SCRIVNER. So that if you were out in the cold, outside, even as mild as it is today, it would make a difference of about 40° in the outer temperature, so probably there would not be as much perspiration as there would be in here.

Mr. SLAUTA. No, sir; there would not.

Mr. RILEY. Does it feel comfortable? Is there any irritation?

Mr. SLAUTA. None whatsoever, sir. I have worn the suit for a period of 45 days and developed no skin irritation whatsoever.

Mr. SCRIVNER. What is the reaction of these buttons which have been referred to, against the skin?

Mr. SLAUTA. I have no consciousness of the buttons, sir.

Mr. SCRIVNER. Where have you worn this suit for 45 days?

Mr. SLAUTA. I wore it in Korea for that period.

Mr. SCRIVNER. Since you can tell us from actual experience instead of what somebody else has said or from what is written in the book, will you tell us exactly what your reaction to it has been?

Mr. SLAUTA. The suit shows a great deal of promise for use in wet, cold climates, such as we have in some of our positions in Korea today and elsewhere across the world.

The features that Dr. Henschel pointed out are very desirable, the one feature of the insulation not wetting; the insulation is always perfect, regardless whether you are perspiring because of strenuous activity, your insulation will remain perfect, so that you can get wet to a point where perspiration will actually drip off your arms, and as soon as you stop, you are perfectly comfortable and the wet skin and the wetness that is accumulated in the suit will dry out in a period of about an hour and a half.

Mr. SCRIVNER. So that you are perfectly warm during that time?

Mr. SLAUTA. That is correct.

Mr. SCRIVNER. Then what happens, even though you should cease active exercise—for instance, you might have to stop for any number of reasons; you might have to hit the ground—there are situations where that would happen quite often, of course—then what happens? What is the reaction?

Mr. SLAUTA. That is really one of the outstanding features of the suit. It permits a man to remain sedentary for a longer period of time than he can with the conventional type clothing.

You could lie on the snow with this, actually sleep on the snow or frozen ground and get no heat conduction out of the suit.

Mr. SCRIVNER. Do you get any conduction of the cold into the suit?

Mr. SLAUTA. No.

Mr. SCRIVNER. You have actually done that?

Mr. SLAUTA. Yes, I actually have in cold chambers been able to lie on a concrete floor with a temperature of minus 40 and fall asleep and sleep soundly.

Mr. SCRIVNER. On a concrete floor?

Mr. SLAUTA. That is correct.

Mr. RILEY. With no bad after effects?

Mr. SLAUTA. None whatsoever.

Mr. SCRIVNER. Now, that looks rather heavy and clumsy. What is the actual reaction as you wear it out in the field?

Mr. SLAUTA. It is quite light and not very bulky. The entire suit weighs just a few ounces less than 5 pounds.

Mr. SCRIVNER. We may be getting somewhere with this.

Mr. SLAUTA. You might be interested in this. This is a picture of Lieutenant Johnson swimming in the Han River, Korea, on the 23d of January this year with a water temperature of 33 degrees, and the ambient temperature 37 degrees, with about a 20-mile-an-hour wind blowing. He was able to lie in that water for a period of 20 minutes.

Mr. SCRIVNER. Wearing this type of suit?

Mr. SLAUTA. That is correct. When he left the water, it took a very short period for him to restore his body heat. That is another feature of the suit. You can warm up very quickly; within 5 minutes he was warmed up again.

Mr. SCRIVNER. That raises another natural question. Inasmuch as you can warm up quickly, what has been your experience, as you were out in the field, where you were active, moving around, did it cause any particularly excessive perspiration that would weaken you in any way?

Mr. SLAUTA. Of course, you can control the amount of perspiration you put out in this suit by ventilation, by opening the suit, for example, or opening the wristlets and permitting the cold air to flow up your sleeves or up through the jacket. There are any number of ways that you can ventilate to cut down perspiration to a minimum. You cannot eliminate it completely, but you can cut it down.

The important point is, regardless whether you are perspiring or not, when you stop, you still have perfect insulation.

Mr. SCRIVNER. What about the pants?

Mr. SLAUTA. The pants are identical to the jacket.

Mr. SCRIVNER. Is there any restriction of movement?

Mr. SLAUTA. No, sir.

Mr. SCRIVNER. It is perfectly free?

Mr. SLAUTA. Perfectly free.

Mr. SCRIVNER. It is probably less bulky than would be two or three suits of long johns?

Mr. SLAUTA. I would say so; certainly less bulky.

Mr. RILEY. What is the life of this material?

Mr. SLAUTA. That is one of the problems that we face. It is not very durable in its present state. I could tear it right here very easily. However, when I put this protective shell over it, it is all right; but

that is one of the problems that we have to solve. We have got to increase the durability of it without taking away from the flexibility that we have in the suit.

Mr. RILEY. Is the material under the armpits the same as that from which the jacket is made?

Mr. SLAUTA. Yes, sir; it is the same material. However, it is cut much thinner, just one-eighth of an inch thick. If you notice, every place where that material is put at the hinge points on the body, it is cut thinner, where it will not interfere with movement.

Mr. FLOOD. Do the medical people say anything about wounds with that kind of equipment?

Mr. SLAUTA. They have not yet. They are studying the suit at the present time, I believe.

Colonel HICKEY. Yes, they are.

General MARIS. One interesting thing is that this gives pretty good protection against napalm.

Mr. RILEY. Following up Mr. Flood's question, is there any chemical in this material so that, if shrapnel were to go through it, it would cause infection?

Mr. SLAUTA. I cannot answer that, sir.

General MARIS. When they tested it with napalm, the napalm did not go through the material.

Mr. HENSCHEL. It has a characteristic of protection against flash. It was experimented with, with napalm when Mr. Slauta was over in Korea and perhaps he would like to tell you about that.

Mr. SLAUTA. I would prefer that Dr. Siple tell you about that.

Dr. SIPLE. We were asked about protection from fire, so we got some napalm and tried it and found that it will not support combustion by itself. It will burn in the presence of a flame, but it will stop immediately after the flame goes out.

One of the members of our team was so impressed that he immediately offered to try it on his back and he leaned over and with the jacket pulled tight across the back, some of this napalm was lit, and he did not even feel the temperature come through the material, to his skin.

Mr. HENSCHEL. Another characteristic of this material is that it has antigas qualities, too. Normal contact gas does not really penetrate it as it does cotton in ordinary clothing.

Mr. SCRIVNER. Have you any estimate of the approximate cost of this set, as it is, with the under jacket and the protective shell, the pants and the protective outer part?

Dr. HUNTER. I would not want to venture an estimate; no, sir. This is a hand-made suit. There is lots to be done to get this into the design that we want. It is a new material. The cost is much higher now than it is going to be because production capacity is not available.

There is one company that is developing ways and means of making this sponge in a uniform manner. Several other companies are working on the same problem, so we expect an abrupt drop when production of this material becomes available.

Mr. SCRIVNER. Have you not been given any estimate at all?

Dr. HUNTER. I would say probably that suit as it stands there is worth $100; but it is a long way from production cost.

Mr. FLOOD. What is the raw material from which the sponge is made?

Dr. HUNTER. Polyvinyl chloride. It is one of the most important of the high polymers in the country today. Goodyear and other companies are using this in shower curtains and a lot of the artificial leather that you see on chairs is made of the same basic polymer.

Mr. FLOOD. Then basically it is of chemical composition?

Dr. HUNTER. That is right, sir.

Mr. FLOOD. And the raw chemicals that are incident to the basic material are produced in continental United States?

Dr. HUNTER. They are, sir. We are the largest producers in the world of this polymer. The production capacity has gone up, so that there is plenty of capacity in this country for it.

Mr. FLOOD. That zipper, is that the best kind of closure?

Mr. SLAUTA. It is the most convenient type; yes, sir.

Mr. RILEY. Will it take buttons?

Mr. SLAUTA. The buttons would leave gaps.

Mr. HENSCHEL. We also are applying the same material to other types of wear. Here is a pair of mittens to be used under a shell for cold-weather handling of equipment.

Here is a helmet, headgear also that can be worn underneath the regular helmet.

Mr. FLOOD. Could this be a substitute for the parka equipment that is used in the north?

Mr. HENSCHEL. I do not know whether it would be or not. There is a possibility that it could replace at least part of the regular Arctic equipment.

Mr. FLOOD. Do you say that this has protection against mustard gas?

Mr. HENSCHEL. As material it has not been tried against the gas, and it has characteristics that one would expect of resistance to gas penetration. These polymers are resistant to penetration.

Mr. FLOOD. No experiment has been made on that?

Mr. HENSCHEL. No experimental work has been done on penetration.

Mr. FLOOD. You have not gone very far other than the incidents that you mentioned as far as flash burns are concerned here?

Mr. HENSCHEL. That is right.

Mr. FLOOD. I suppose you are going to pursue that to some extent?

Mr. HENSCHEL. Yes, sir.

Mr. FLOOD. And gas resistance as well?

Mr. HENSCHELL. Yes.

Mr. FLOOD. This can be used in any temperatures—north and south?

Mr. SLAUTA. That is one of the problems that we have yet to solve, sir. We have not actually established a temperature-range use for the suit. We have devoted most of this winter to doing that, by conducting tests in Alaska, Churchill, Camp Drum, and Korea.

Mr. FLOOD. Was this material experimented with at Fort Drum a month or so ago?

Mr. SLAUTA. Yes, sir. But we are continuing this work. It is going on at the present time. We are going back to Camp Drum to do additional work.

Mr. FLOOD. Are you a civilian?

Mr. SLAUTA. Yes, sir.

General MARIS. You might also indicate what you are doing in order to save the large number of other boots which we now have in stock.

Mr. HENSCHEL. We have an insert, an insulated insert to be used with the shoe pac. Instead of the two pairs of ski socks, this is a barrier insert to be placed inside the shoe pac, to extend its range and its usefulness. That incorporates all the principles that are in that insulated boot.

Mr. SCRIVNER. Will this insert go into your heavy arctics as well as your shoe pac?

General MARIS. This particular insert is made for the shoe pac.

Mr. SLAUTA. You maye be interested to know that we do have the insulated boot on the feet of our troops in Korea. All the men who are required to be exposed are equipped with this boot and it is doing a remarkably good job, cutting down weather casualties. In fact, the time we left, there were only isolated incidents where men had developed frostbite with the boot. In other words, a man who had been wounded and had to lie out for 3 or 4 hours before he could be picked up; are incidents where men had punctured the boot, wetting the insulation and developed frostbite. But it is being very well received and it is giving a wonderful account of itself.

Mr. FLOOD. How many pairs of socks are worn with that boot?

Mr. SLAUTA. Just one.

Mr. RILEY. You say that the troops in Korea in the field are pretty well equipped with that boot now?

Mr. SLAUTA. Yes, sir. All our infantrymen are equipped with this boot.

General MARIS. The report which came back was that next to the M–1 rifle, that was the item which the soldier valued most in cold weather. It is a splendid boot.

Mr. RILEY. Thank you very much, gentlemen.

Colonel HICKEY. A program to make the maximum effective use of our domestic wool production in time of national emergency is also under way, through research to determine the best available materials for extending the domestic wool supply for the production of military fabrics. Another critical material for which it is essential a substitute be found is waterfowl down and feathers which are required for our sleeping bags for combat troops.

Studies of the Climatic Laboratory will continue to supply basic facts on the protection of personnel from environmental impacts.

SLEEPING BAGS

Mr. SCRIVNER. With reference to the sleeping bag, which you just mentioned, can this same material be made use of for that if it has all the qualities that you have described?

Colonel HICKEY. I would like to ask Dr. Hunter to speak on that.

Dr. HUNTER. They are exploring that as another possibility. Of course, in a sleeping bag, the bulk factor is very high. The one property that we like in a sleeping bag is that you can roll it up into a very small unit, because it has to be carried for considerable distances before being put to use. We do not know whether we can compress

this in bulk so as to make it a practical load for someone to carry. However, I think it has definite possibilities on the medical side, where people are going in to pick up wounded, it gives them a chance to preserve the body heat, which is so important in cases of shock. I see chances there more than for general issue for sleeping bags because of the bulk factor.

Mr. SCRIVNER. Would there not be a practical application of something like this in picking up wounded and transporting them where they are exposed?

Dr. HUNTER. You have a definite possibility there.

We are looking into that. This is another example, gentlemen, of a new material that becomes available in sufficient volume so that you can go into production, you can do things with it and explore it in many directions.

The interesting thing about it, you may have noticed, is that this insulation comes from having disconnected little air bubbles all through it. Wherever insulation or buoyancy is needed, this is what we are exploring to see whether this material can be used.

QUARTERMASTER SUPPORTING RESEARCH AND OTHER OPERATIONS

Colonel HICKEY. Budget activity 1600, "Suporting research and other operations," fiscal year 1951, $1.7 million; fiscal year 1952; $2.1 million; fiscal year 1953, $2.9 million.

Included in this activity are the programs on low-temperature rubber, fire resistance, auxiliary heating devices, and basic research. The Army-wide low-temperature-rubber research program of fiscal year 1951–52 resulted in the synthesis of six different synthetic rubbers which, to varying degrees, maintain their functional properties as low as minus 65° F. These are being experimentally evaluated in the terms of tires and other items of military importance. A deficiency common to all these arctic rubbers is their lack of resistance to oil and gasoline. An arctic rubber with oil-resistant properties is the focus of continued research. At present there is no answer to this problem.

Colonel HICKEY. I would like to ask, Mr. Chairman, that the balance of the statement be off the record.

(Discussion off the record.)

NECESSITY FOR INCREASE IN QUARTERMASTER RESEARCH

Mr. RILEY. Would you explain the necessity for asking an increase there of some $800,000?

Colonel HICKEY. In a general way mainly it is more apparent than real, sir. Before this time we have carried capital equipment across all the budget activities. This year the capital equipment is gathered together under this particular budget activity. It represents $650,000 of the total difference.

The other two items I would like to ask Dr. Hunter to speak on.

Dr. HUNTER. The rest of the increase comes from new assignments which have been given to us by the General Staff. They comprise a problem of working on containers for handling of nonconventional fuels in the amount of $174,000. You have probably heard of the

nitric-acid idea and things such as that which are looming up as very important fuels for various missiles. We have gotten to the point now where somebody has to decide what to use for transporting such fuel. Since the Quartermaster has the responsibility for delivering fuels, we are looking into that problem in a new assignment.

(Discussion off the record.)

FUEL FOR HEATING UNITS FOR TROOPS

Mr. SCRIVNER. We had a rather startling statement last week in connection with heating units for troops, in which it showed that by the use of gasoline heaters the fuel consumption for troops had risen tremendously. Of course, the cost of the gasoline being transported to remote areas makes that a rather expensive undertaking. Has the Quartermaster in any of its studies sought to develop any other method of heating for our troops using any other type of fuel?

Dr. HUNTER. We have investigated the possibility. Most of our burners are so built that they will take whatever fuel is available. If we can get wood, for instance, those for Arctic use will handle wood. If they get coal they can handle coal. But the standard thing you have to fall back on is gasoline if the rest are not available. We have very strenuous research on trying fundamentally to study burning conditions so we can increase the output from a gallon of gas used in heating. We are also making a study on the proper design of stoves for tents and other military utilizations, so that we get the maximum reflection from the hot stoves. We are fully conscious of that problem.

Practically, from a supply line standpoint, it is a very difficult matter to get another type of fuel in the supply line and be sure we have it. But we do recognize the problem you have raised and we have most of these burners for multiuse purposes.

Colonel HICKEY. I would like this off the record.

(Discussion off the record.)

Mr. RILEY. Do you have any questions, Mr. Schivner?

Mr. SCRIVNER. No questions.

Mr. RILEY. Thank you very much, Colonel.

General MARIS. Mr. Chairman, this completes the Quartermaster presentation. Next Colonel Griffing will present the Army-wide items that go across the board.

ARMY-WIDE RESEARCH AND DEVELOPMENT

Mr. RILEY. Colonel Griffing, do you have a statement here?

GENERAL STATEMENT

Colonel GRIFFING. Yes, sir. I am representing the budgeting and assembly of the miscellaneous section known as the Army-wide budget, which comes into my responsibility.

Mr. Chairman and members of the committee, as part of the overall research and development program for the Department of the Army, there is a segment which is termed the Army-wide program. I am sure you realize that in spite of our organizational structure,

which includes the various technical services, there is a requirement for assembly and monitorship of a research program, the various parts of which are not assignable to any existing Army research and development agency and which, also, affect a number of or all of the agencies in the Department of the Army. Also, the Army is of necessity engaged in research projects jointly with the Navy and Air Force, as well as with outside Government departments. It is this particular program which I now propose to discuss.

For this activity we are requesting $10.1 million in 1953 as compared with $5.1 million in 1952, and $3.9 million in 1951.

BUDGET PROJECT 1510—PERSONNEL OPERATIONS

Fiscal year 1951, $0.9 million; fiscal year 1952, $1.2 million; fiscal year 1953, $3.1 million.

This project provides for research in the field of human resources and accounts for a substantial portion of the increase in the total budget. There has been a long-recognized requirement for increased research in this critical area which, within the past year, has come into much more positive focus than heretofore. It is a type of research which is sometimes misunderstood but which we feel will pay ever-increasing dividends. Human resources research can best be described as that designed to make the human being more effective in his role as a soldier in combat. It includes: research in training methods; methods for improving the motivating forces within the soldier; psychological warfare; and various classification, utilization, and assignment procedures which make the limited manpower available to the Army more effective man for man.

This research is carried on in the main in the following agencies: (*a*) the Human Resources Research Office, (*b*) the Navy's Special Devices Center, (*c*) the Personnel Research Section, The Adjutant General, (*d*) in some segments of all of the Technical Services, and (*e*) by subcontract with outside agencies.

THE HUMAN RESEARCH OFFICE

The Human Research Office which represents the primary agency, was established by contract with George Washington University in August of 1951. It consists of a central staff, plus three field research units, under the supervision of the Army Field Forces, at various centers of military population. The first unit (Training Research) has been established at Fort Knox. The other two (Morale and Motivation, and Psychological Warfare) are in the process of being set up. The total financial requirement for fiscal year 1953 for this agency is $2.6 million, of which $950,000 is included under project 1640, over here at the right of the chart [indicating], since it is in another operational category than this one.

NAVY SPECIAL DEVICES CENTER

Navy Special Devices Center is designed for research in the area of training aids of the more complicated type and the Army's participation therein represents our effort in this very important method by which training time can be shortened and training can be improved.

Our financial requirement in support of our participation in this agency is $950,000 for fiscal year 1953.

THE PERSONNEL RESEARCH SECTION OF THE ADJUTANT GENERAL

The Personnel Research Section of the Adjutant General is designed to conduct research in the field of personnel operations, classification, utilization, etc. This phase of the human resources program will be taken up separately, since the Adjutant General administers its own research, and development program and budget.

The various technical services have numerous research projects in the field of human engineering, which are primarily pointed toward the design of equipment with the man who will use it in mind, rather than the design of a piece of material without regard to the physical capabilities and the intelligence of those who will use it. I merely mention this in order to round out the discussion of the human resources research program, since the budget responsibility for this segment rests with the technical services themselves.

BUDGET PROJECT 1520—INTELLIGENCE AND PLANNING OPERATIONS

Fiscal year 1951, $2.5 million; fiscal year 1952, $3.2 million; fiscal year 1953, $5.1 million.

This project provides primarily for continued work in the important field of operations research.

I am sure you gentlemen remember the other afternoon when we had Dr. Johnson present in the committee hearing and he discussed a number of his findings in connection with the operations research program.

The Department of the Army Operations Research Office is maintained by contract with Johns Hopkins University. The mission assigned to this agency is to undertake such scientific studies as are desired by the Army in order to provide a scientific base which will assist the various commanders and staff officers to arrive at a proper decision when this scientific base is considered in conjunction with all of the other factors which go into the decision-making process. These studies are undertaken by the highly trained scientific personnel made available to us by this contract and comprise, in general, some 18 basic projects. Examples of the type of studies which they undertake are: (1) analysis of infantry weapons and their employment; (2) evaluation on a continuing basis of the employment of atomic weapons in Army operations; and (3) the study of armored warfare to ascertain armor's probable role in war as it may be affected by current developments in technology and tactics, new tank and antitank weapons and new methods of employment.

You can see that by the use of these studies the Army is attempting to make certain that we do not overlook any consideration which may add to our over-all effectiveness. The dollar value of such type of research is hard to measure. For example, one recommendation concerning vehicle design might well result in the saving of many millions of dollars, and, of course, there are many recommendations which, when considered with other factors, do not stand up.

This agency has maintained a field team in Korea ever since the summer of 1950 and the studies made in that area have been extremely valuable in enhancing our future efforts.

Dr. Johnson talked about the studies they had made there. A particular point in question was the armored study, of which he had a copy of the report.

Since this fall, there has been a field team in the European theater which has been working closely with the military in that area in various studies designed to assist them in the solution of their problems.

We are asking for $4 million for the support of this agency for fiscal year 1953.

BUDGET PROJECT 1630—SUPPORTING RESEARCH IN OTHER TECHNICAL FIELDS

Fiscal year 1951, $0.4 million; fiscal year 1952, $0.7 million; fiscal year 1953, $0.9 million.

This project provides for Army-wide participation in various interdepartmental research and development activities.

BUDGET PROJECT 1640—OTHER OPERATIONAL CATEGORIES

Fiscal year 1951, 0; fiscal year 1952, 0; fiscal year 1953, $0.9 million.

This project provides for a portion of the funding for Human Resources Research Office as previously mentioned.

Mr. RILEY. Colonel, can you give me as a layman some concrete examples of what you are doing and the results of some of these programs?

Colonel GRIFFING. You mean in the human resources research field?

Mr. RILEY. Yes.

Colonel GRIFFING. Yes, sir. Of course, as you know, in the various agencies we try to develop a completely rounded program in all of the areas of that type of research that our Research and Development Board feels are indicated. Within the Human Resources Research Office, for example, we operate in three general areas: The area of morale and motivation; training; and psychological warfare. For a good example of some of the problems which we hope they will be able to solve for us I would like to ask Dr. Crawford, who is the Director of this particular agency, who is with us here, to say something.

Dr. Crawford came to us on loan from Vanderbilt University to head this agency in August of last year. He has been busy over the last 8 or 9 months in staffing his organization and setting up the training research unit. I would like to have you meet Dr. Crawford. Perhaps he will be able to tell you a little bit more in detail about some of those projects which are involved.

MORALE AND MOTIVATION

Mr. SCRIVNER. Before he speaks, tell us what you mean by morale and motivation.

Colonel GRIFFING. It is a good question. You know and I know, sir, that a soldier is a soldier by and large not by choice in this day and age, although there are career soldiers.

This is just no way really to make this business of fighting a war attractive. However, if by research and as a result of research we can develop policies for leadership and getting the best out of these people, we feel we can make it tolerable and that he will be a better soldier in spite of his inherent dislike for the business of fighting a war, than he would otherwise.

I think it is common knowledge that the Eighth Army as it stands over in Korea today is one of the greatest and most effective armies that the United States has ever assembled, but it has been developed right in the crucible of war. There is no question in my mind about that, and I think we all appreciate it has come to the point of its efficiency over a number of months.

We hope that by research by the people who are skillful in that type of approach to a man's inherent likes and dislikes, and the things that make him tick, that we can get such an army together sooner, and instead of taking 6 months to develop a fighting force in a given theater we may be able to do it in 3 or 4.

The motivation is what makes him pick up his rifle and go and do what he has to do in spite of the fact that he does not want to do it. Of course, that is something every officer and every noncommissioned officer in the United States Army worries about and tries to provide. Leadership qualities in our leaders are the things we look for most.

On the other hand, we feel that there is an area and there is a possibility that research can help to give us shortcuts and ways to get to the soldiers and make them do their job better and quicker. That is a generalization, sir. Perhaps Dr. Crawford could go into more detail.

Mr. SCRIVNER. I hope he can go into more satisfactory detail than that. We have had armies since the beginning of the Nation. I thought, or I have always lived under the impression that they did a pretty fair job in World War I. At least I thought we did pretty well. Yet a great portion of that army was made up of men who were in the service involuntarily. There were some of us who were volunteers, of course, but without being able to recall the exact figures now I can recall that a great number of those men were what we then called draftees. They call them selectees now. I do not know that it is any more palatable, but the results were the same, of course. We did a magnificent job of fighting with the time we had to prepare. We did not have any research in morale; we did not have any research in leadership; and we did not have any research in motivation because the motivating power was the fact that there was a war on and we had been called to do some fighting, and we wanted to get the job over with successfully and get home just as quickly as we could, and that was what was done.

Much the same situation developed in World War II, except that there were a far greater number of involuntary members of the Armed Forces than in World War I—not only in numbers but in proportion. The figures now available indicate that by far the vast majority, and, as a matter of fact, practically all of your troops now fighting in Korea are there not because they volunteered for military service, but because they were called through selective service and the duty imposed upon them to fight in Korea. That was without any research in motivation.

My contact with many of these programs has left me pretty cold. We have had human beings here on the earth ever since Adam and Eve. We have had men in the military service ever since the beginning of the Nation. Certainly if we have not learned what makes men tick; if we have not learned what constitutes a proper type of

leadership at this stage of the game, we have been wasting a lot of time.

Colonel GRIFFING. Yes. I think your point is very well taken. However——

Mr. SCRIVNER. We have heard as a background and a basis for a lot of these things the old phrase of putting square pegs in square holes and round pegs in round holes. But they have not sold me by far on either the results of the program or the justification for the expenditure of the sums of money requested. If either you, or the doctor, or General Maris or somebody else can give a good sales talk here, maybe you can change some of my views, but you are going to have to paint a very clear, concise, and practical picture.

General MARIS. Sir, with respect to your statements of World War I and World War II, I agree with you on some, and some I think research will show there was a division side by side with another division which did not do the same quality work. You were in a very good division in World War I and fortunately so was I, I recall. However, there were some divisions who did not do well, as you undoubtedly well know. They did not do well. Why? They were the same type of people. What make them tick? Why are not those divisions doing well when others next to them do well?

One of our biggest problems now is manpower and utilization of our men, which is something we are in short supply of, as we all know. How are we going to utilize these people? Part of it is psychological, possibly. I do not know what it is. I have worked with these men in my outfits. I could see no reason in the world why they should not do well and should not function, but we lost a large percentage of them. We had to weed them out of our outfits before we could take them into combat, because they were like bad apples in a barrel. We have to determine what it is we must do in order to be able to utilize all of this mass of people more effectively.

RECRUITING METHODS

Mr. SCRIVNER. I have trained quite a few hundred young men, if not thousands of young Americans, and I believe one of the first things that has to be developed is a feeling of confidence not only in the capability of the man who is above them in their fairness and in the fact that they are told the truth. A lot of your men have been started out in service wrong recently because at the very outset they were lied to. I say that for this reason. Maybe this is not your province, but certainly it is some of the background which you should consider and upon which your recommendations should be made. Of course, my view is that I must always tell the truth, but we have not always been told the truth, not even in this committee. Young men have been told by the recruiting staffs that if they will enlist they can thereupon make their choice of the branch of service in which they desire to spend their enlistment period. Then all of a sudden, "whammy." They are not sent there at all, but usually they have been sent to the infantry, which they probably did not want and that may have been their very reason for enlisting and making a choice. From that time on that man is not going to be a topnotch man unless something happens. You started him out bad.

I know what my reaction would be if I were a youngster and in order to induce me to enlist I was told this story of choice of branch, so that somebody in a recruiting office could build up his quota and possibly get a long week-end pass. Let us say that they have promised I could go in the Artillery, or that I could go in Ordnance, or that I could go in the Engineers, or that I could go in the Quartermaster, or any number of branches of the service. Then I said, "All right, I will sign up for my 3 years." Then I am not given the privilege of serving in that branch of the service, although I was told I would be. From that time on I would be sour about it and I would be inclined to doubt the word of any man who ever told me anything, and I would be perfectly right in so doing, because I would just say to myself, "Now, wait a minute, brother. Don't give me all that soft soap because that is what got me in here in the first place, and they lied to me. The way I feel about it is you are probably lying, too, so nuts to you."

Have you taken up anything like that, and if so, what would your recommendation be?

General MARIS. In that connection, sir, I will go back to my own experience in Japan, where on one occasion we did have to make changes. I would prefer this to be off the record.

(Discussion off the record.)

Mr. SCRIVNER. You can use a little moderation in your recruiting program. I have read some of the posters outside of the post offices and recruiting offices to induce young men to volunteer for what at that time—the time of which you are speaking—was a 2-year tour of duty. The background of the posters shows palm trees and nice white sand beaches and some other things that I can recall at the present time. Also, how glorious it was just to go in and do comparatively light duty and see the most entrancing spots in all the world.

General MARIS. Some who were fortunate did get it, but most of them did not.

Mr. SCRIVNER. I do not know whether very many of them thought the recruiting poster promises were fulfilled or not. I am inclined to think very few of them did.

Now, there is a case where the wrong advertising and, as a matter of fact, untruthful advertising, oversold the thing and was too glowing, and too beautiful, and too easy, and too soft. It probably soured a lot of young men on service in the military, or any future military service, because when they woke up to the stern realities of military life it probably was something of a shock to them. Of course, you know from experience, and I know, and most of the rest of us know, that that is what they should have expected, but they did not. They did not have any reason for expecting it. They had every reason in the world to believe that the United States Army or the recruiting forces for all three branches of the service were telling them the truth.

If you do not get back and change some of that, why, a lot of the rest of this research on so-called motivation and a lot of your research on morale is probably going to be wasted.

General MARIS. And leadership. Those three go together.

Mr. SCRIVNER. Because on the very first step they take you are starting them off wrong. Maybe the youth of America has become soft. Some people think so, but I do not. I think you can appeal to

a young man by challenging him. You do not have to make him afraid or promise him anything, but just appeal to his courage, pride, stamina, or "guts"—you doctors probably have another word for it. I can recall as kids one of the most popular games was the game of dare. Somebody would start out and say something like, "All going my way jump the ditch, and so forth." It was to the effect that if you had "guts" enough you would follow me, and if you were "chicken," why, you would just have to go around the other way. It is surprising how many youngsters you would normally put your finger on and say, "You do not have enough 'guts' to follow me up this rail." Well, he is right there behind you and when you get across he is right alongside of you. So I think they still can be challenged. I think they have still got the "guts" young Americans always had, and you are not called upon to make it a fancy cake party at all.

Am I right or wrong?

General MARIS. I think you are perfectly right. I am not aware of all the details of the recruiting part, but I think——

Mr. SCRIVNER. Somebody should start studying it.

General MARIS. Yes; this entire program was presented and discussed for a long period of time throughout all of the echelons. Then it went all the way through, and was discussed with Mr. Pace who finally approved it.

Mr. SCRIVNER. I would start the other way. I would work from the ground up.

General MARIS. I mean, this human-research program which we are instituting here.

Mr. SCRIVNER. I know, but you are working on the wrong end of the show. You ought to be working on the other end, where you would pick it up and talk to some of your enlisted men themselves and proceed from there.

General MARIS. What I mean is the authorization for this program.

METHODS OF RESEARCH ON MORALE AND MOTIVATION

Mr. SCRIVNER. I should not be testifying. I should be listening. But on some of these things if you or if somebody could talk more to your man right down at the tail end of the platoon, the "pee-wees" who have the hardest going of it of all and get their reaction to some of these things and let them tell you their story and start from there, you would get some stories that would raise the hair on your head, and you might get some of the mental reactions upon which you could then work.

How you are going to do it I do not know, because they will not talk to you. They will not talk to me, but they will talk to some one in their squad. I would like to hear something about that.

General MARIS. Dr. Crawford is going to talk on the approach.

Dr. CRAWFORD. To speak directly to your point about talking to the enlisted men, that is part of our plan, and we have already established one field unit at Fort Knox, and are about to establish another one. We do not know what the answer is to these problems, but we do know this: There are within the Army very able and very well-motivated people. There are others who are not.

Mr. SCRIVNER. Now define that "well motivated." It will mean one thing to you and it might mean another thing to me.

Dr. CRAWFORD. I would say it is two things. They are eager to learn and train and are ready for aggressive contact with the enemy. Our research program is to discover the qualities that these aggressive, eager people have, to study how they got that way so that we can bring the other group who are not and who do not have that eagerness and aggressiveness, up to scratch.

As General Maris pointed out, one of the big difficulties is the manpower shortage. We have to make the best use of every man we have.

I would like to emphasize in Human Resources Research Office we do not know the answers. We think we have some techniques that are common sense, although nothing fancy. They involve, as you suggest, talking with people and observing them and formulating general conclusions and recommendations for training and for the improvement of morale. It has been pointed out that this is a new organization. We cannot yet show you results since we have been going only a few months.

Mr. SCRIVNER. Have you not had any reports as yet from Fort Knox at all?

Dr. CRAWFORD. The unit at Fort Knox began on the 1st of January. At the present time they are doing two things. They are making a general survey of research requirements in basic training with some specific work already under way. That specific work has to do with whether or not particular items of basic training can be taught more rapidly than they are now being taught.

HUMAN RESOURCES RESEARCH COMPARED WITH OPERATIONS RESEARCH OFFICE

Mr. RILEY. Doctor, this is a comparatively new program, as I understand it. Wherein is it different from the research that is being done by the Operations Research Office?

Dr. CRAWFORD. The difference, sir, lies in the type of research. The Operations Research Office is concerned with operations research which has to do with an immediate solution to an operations problem. We are set up as a developmental research agency which is to come out with more generally applicable solutions on the basis of experimental work. For example, in training. In our training studies we would compare two kinds of training procedures which would take some time relatively to come out with, but would come out with a general conclusion that would be applicable to several different situations.

Of course, we work closely with the Operations Research Office, and this is my opinion—the kind of research which the Operations Research Office gets, or the results they get, leads into further problems for study by a delevopmental organization. In many cases they turn up problems which take a long time to solve on a developmental basis.

Mr. RILEY. You have not been in operation long enough to give us any concrete developments then?

Dr. CRAWFORD. No, sir, except to tell you the plans for organization and the kinds of things we are doing. I could offer more examples, as, for example, in the area of motivation and morale, we are currently entering into a subcontract for a study of the first 6 weeks of basic training in terms of such indexes of morale as being absent

without leave. Also, studying such things as the distance that the trainee is from home, and what kind of treatment he has. I think we are going to come out with conclusions that have to do with his distance from home. If he is given, shall I say, a fairly rigorous Army treatment at the start, he is better off in the long run than if he is allowed to go home often.

In the studies on leadership, as I suggested, we would first of all study units which are good, and units which are poor, with the attempt to see what the nature of the leadership is in those two groups.

Mr. RILEY. Doctor, you said you had made a contract to so some research work on this. With whom was that made?

Dr. CRAWFORD. We have made it with representatives of New York University. Part of our work we expect to do through subcontract with competent agencies.

Mr. RILEY. Thank you. Mr. Scrivner.

REASONS FOR INCREASE IN FUNDS FOR ARMY-WIDE RESEARCH

Mr. SCRIVNER. Colonel, this presentation shows that your requests have grown from $3.9 million in 1951 up to $5.1 million in 1952, which is about a one-third increase. Now it is almost double in 1953. What brings about that increase? Is it an increase in personnel or an increase in material or facilities?

Colonel GRIFFING. The big percentage of that increase is in the research in human resources area in setting up our Human Research Office. There was no money furnished for that in 1952. We were able to initiate it on a very small scale by reprograming and by asking the Research and Development Board from their reserve for additional funds to get it started, because we had realized it was long overdue.

Mr. SCRIVNER. Were there any funds set aside at all under the 1952 funds for the Human Resources Research Office?

Colonel GRIFFING. $100,000 for a training unit at that time, sir. That was all.

Mr. SCRIVNER. That was all. So the $2,500,000 is an entirely new activity?

Colonel GRIFFING. That is right, sir.

Mr. SCRIVNER. For which you are seeking almost half of the proposed increase?

Colonel GRIFFING. That is correct, sir. There is another million dollars there for the Operations Research Office.

Mr. SCRIVNER. I have not gotten down to that yet.

Colonel GRIFFING. In their expansion.

NAVY SPECIAL DEVICES

Mr. SCRIVNER. Now what is the type of research under "Navy special devices?" Is that some of your old mock-up items?

Colonel GRIFFING. Sir?

Mr. SCRIVNER. That the Navy has been carrying on for years?

Colonel GRIFFING. With this current trend toward the guided missiles and very complicated radar and the ways and means of waging

war, it is becoming increasingly difficult to train the average individual in the operation of these types of equipment.

Mr. SCRIVNER. Having been on the committee for some time, I am well acquainted with the Navy special devices program.

Colonel GRIFFING. Yes. They are training devices of the complicated type.

Mr. SCRIVNER. In other words, this is a continuation of that and an application of that to Army-wide practices?

Colonel GRIFFING. Yes, sir. The Navy has it at Sands Point.

Mr. SCRIVNER. So that inasmuch as the Navy has already had this type of program under way for some years, what it amounts to is that you are working with them and, as a matter of fact, probably will transfer some of these funds to the Navy Special Devices Center?

Colonel GRIFFING. That is the way we will do it.

Mr. SCRIVNER. Will all of it be transferred to them?

Colonel GRIFFING. All of the "Special devices" money goes to the Navy and we have a participating group up there representing our interests.

Mr. SCRIVNER. So that this is about what they consider is the Army's share of the expense of that program?

Colonel GRIFFING. That is $950,000, sir.

General MARIS. May I amplify it a little bit? It is only for the items we request. We only fund for those items which we ask them to develop.

Mr. SCRIVNER. But they know just what to do from all of these years of setting up these devices and making mock-ups, and all of the rest of that stuff.

General MARIS. Yes, sir.

Mr. SCRIVNER. So there is no use trying to take the time necessary to set up a separate staff for it.

General MARIS. Yes, sir. And it saves a little money in so doing.

Mr. SCRIVNER. We actually have an example of brotherly love there among the services, and it should work out to the general advantage of all.

Mr. RILEY. Would you yield right there?

Mr. SCRIVNER. Yes.

Mr. RILEY. Does the Navy contribute to any of your programs?

Colonel GRIFFING. Yes, sir. I do not know the exact figure that the Navy puts in, but it is more than we put in.

Mr. RILEY. In which one? Do they make allocations to you?

Colonel GRIFFING. I am sorry. I thought you were talking about special devices.

Mr. RILEY. No.

Colonel GRIFFING. They have a somewhat similar program.

Mr. RILEY. But they do not contribute to any of your programs?

Colonel GRIFFING. No, sir.

Mr. RILEY. Thank you.

INTELLIGENCE AND PLANNING OPERATIONS INCREASE

Mr. SCRIVNER. Your next item which shows a considerable increase is that of intelligence and planning operations. In 1951 you had $2.5 million and then it went up almost a third in 1952 to $3.2 million, and now it is $5.1 million, which is twice as much as you had in fiscal

1951. You speak of the Army Operations Research Office being maintained by contract with Johns Hopkins University. What does that next sentence mean in language I can understand? The sentence starting after the words "Johns Hopkins University"—what do you mean by that statement? I listened to you read it and I have read it twice. It does not give me any facts at all.

Colonel GRIFFING. Well, sir, I will try to state it a little differently.

Mr. SCRIVNER. All right.

Colonel GRIFFING. The Operations Research Office has on contract with the Johns Hopkins University assembled for us a group of scientific talent which is designed to go into any area for critical analysis within the Army's field of responsibility in weapons and in weapons systems, in tactics and techniques to evaluate how well we are doing; to point out ways and means whereby this can be done better; and give to the staff or commander, as a result of their findings and reports, advice that he could use to make up his mind.

Mr. SCRIVNER. In other words, is this the actual unit working with Dr. Johnson?

General MARIS. This is Dr. Johnson's unit. This is his outfit.

Colonel GRIFFING. He is the director of it.

SAVINGS BROUGHT ABOUT BY RESEARCH RECOMMENDATIONS

Mr. SCRIVNER. That brings us to the next page. You cite an example in which you say, "Of course, the dollar value of such type of research is hard to measure." I will agree with you. Then you say, "For example, one recommendation concerning vehicle design might well result in the saving of many millions of dollars * * *."

Has any one recommendation concerning motor vehicles brought about the saving of many millions of dollars, or is that purely speculative?

Colonel GRIFFING. I think probably based on their findings in connection with the Korean operations and the tank casualties, the redesigning and the improvement of tank transmissions is going to be a considerable saving in the newer tanks that are coming out. I think they pointed up the requirements there that are going to be very, very definitely to our advantage.

Mr. SCRIVNER. As of now it is speculative then?

Colonel GRIFFING. No, sir. They are working on the new approach as a result of the analyses that were made last year in Korea.

General MARIS. Actually new transmissions, sir, are being designed and will be tested in the next few months because of the critical analysis showing the expense of the old transmission in combat.

Mr. SCRIVNER. You mean that discovery was made by this Operations Research Office?

General MARIS. They analyzed it for us.

Mr. SCRIVNER. And it was not discovered by anybody else in the service, including Research and Development, or Ordnance itself?

General MARIS. These are brand-new tanks. This is the new M–46 tank, which was just being built and tested by the troops in Texas, and which was shipped over to Korea direct from the Detroit arsenal, as you recall. We wanted to know how well those tanks would stand up in combat under all conditions. The troops do not have time to investigate that.

Mr. SCRIVNER. I understand that.

General MARIS. So we put the teams over there under Dr. Johnson's jurisdiction to analyze these things and find out whether this new tank family—because it was the beginning of a new tank family—was going to be satisfactory, and if not, what should be done. One of the things that they came out with was the cost resulting from this transmission; that is, this torque converter, if you recall. So those transmissions are now being redesigned and will be tested, I believe, within the next 3 months, or something like that, when they hope to have the first one ready for testing. If they are satisfactory it will mean the replacement of this new transmission in the entire line of tanks. That will be a very valuable thing.

Mr. SCRIVNER. That will also indicate to me that some of the money spent in times past for research and development and in Ordnance did not end in the type of article that was best for us.

General MARIS. It ended in a very fine article, but an expensive one, and we want to make it cheaper.

Mr. SCRIVNER. But Research and Development did not give you a cheaper vehicle. It gave you the more expensive one, which is one of the things about which we have always been complaining. Yet here comes some other unit which walks in and says, "Here. We have looked this thing over and another design will be much simpler and cheaper." It kind of makes us look like you have been wasting some Research and Development money, because you should have found, or someone in your shop should have run into that with all of the millions of dollars we have spent on Research and Development in tanks and other vehicles.

General MARIS. As you recall, sir, the Field Forces determine the requirements for these vehicles. The Ordnance Department produced the vehicles to comply with the military characteristics, but the next question is, can we afford it? Can we afford it after they have produced it? The next thing is to cut down the cost of these items immediately.

Mr. SCRIVNER. But whoever was responsible for the recommendation of the field forces should have given some thought to this very same problem that has now apparently been developed by Operations Research.

General MARIS. I believe if Korea had not come along then we would have had the time to do this testing before we went into this forced production, and we would not have been in this present situation of having to produce something which we realize was not the best.

Mr. SCRIVNER. You are an optimist, General. Of course, maybe it is probably a good thing that we do have some optimists some place along the line. That has not been the history of it, however.

General MARIS. I will say this: we are certainly working hard in that direction, and that is one of the biggest things we have been working on. I have only been in this job for the last 2 years, and that was one of the major things I felt we should do.

Mr. SCRIVNER. I will agree with you, because we thought that was what we had been spending money on Research and Development for.

General MARIS. We not only want to produce a good item, but get the most economical one to do the job.

Mr. SCRIVNER. What is that slogan up there that the Ordnance kept showing on the back of every chart they had? One of their big words was economy, was it not?

General MARIS. Yes, sir. That is one of the things they have initiated.

Off the record.

(Discussion off the record.)

Mr. RILEY. General, who did this work for the Army prior to the implementation of this program?

General MARIS. It was not done.

Colonel GRIFFING. A large percentage of it had not been done. The Adjutant General had a small personnel research program and they were the main and only agency until we were able to develop this across-the-board program which we feel now is going to be a going concern.

Mr. RILEY. Is there not a pretty close relationship between the Human Resources Research Office and the Personnel Research Division of the Adjutant General?

Colonel GRIFFING. Yes, sir. They work right close together. One supplements the other. The Adjutant General by and large is charged with getting men assigned in the right areas, depending on their intelligence and skills, and education; to identify latent qualities, so that they can be properly trained in something that they can do best. It is a paper and pencil type of identification of their traits and character, and their skills, and what have you. That is by and large what the Adjutant General works on. However, these people go a little further and one implements the other. I think you might say it that way, rather than any other.

Mr. SCRIVNER. Is this the program under which there has been some report, General Decker, about setting up 100 or more stations here and there all over the country, with an unknown number of people assigned to it?

General DECKER. I have not heard of it.

Mr. SCRIVNER. I will bring you a letter on that this afternoon.

Mr. RILEY. Have you any further questions on this? If not, thank you very much, Colonel.

RESEARCH AND DEVELOPMENT BUDGET, THE ADJUTANT GENERAL

Mr. SIKES. General Maris, we are ready to proceed with your next witness.

General MARIS. Mr. Chairman, if the committee please, we should like to take up the presentation for the Adjutant General. The witness who will present this statement is Dr. E. A. Rundquist.

Mr. SIKES. You may proceed, Dr. Rundquist.

GENERAL STATEMENT ON ADJUTANT GENERAL'S OFFICE OF RESEARCH AND DEVELOPMENT

Dr. RUNDQUIST. Gentlemen, the Adjutant General has a small budget which is smaller in fiscal year 1953. He works on personnel evaluation problems including selection, classification, and assignment. The amounts of money involved are shown on the chart and appear on pages 42, 52, and 55 of the budget.

BUDGET PROJECT 1510—PERSONNEL OPERATIONS

Fiscal year 1951, $730,000; fiscal year 1952, $1,500,000; fiscal year 1953, $1,000,000.

The purpose of funds requested under this project is to maintain and improve the wide variety of Army personnel programs, to develop new personnel tools and techniques, and to furnish technical assistance in the implementation of research findings. During fiscal year 1951, a screening program for full mobilization was developed under this project. The Armed Forces qualification test, formerly used only as a screening instrument, was put into use also for equitable allocation of men to the three services. Alternative forms of five tests of the Army classification battery were constructed. Research leading to a revised driver selection program, with emphasis on safety was two-thirds completed. Principles of measurement were applied to the development of tests of small unit effectiveness and a manual to aid units in construction of such tests completed. The Ordnance School and the Armored Center have constructed such tests for current operational use; that is, they have already put the findings into practice.

Research on other personnel problems such as initial classification, selection for specialist training and officer and enlisted efficiency evaluation have been continued. The Terminal Screening Guide for use in detecting malingerers at induction stations has been adopted for operational use. A team of four officers and four civilian psychologists returned from Korea with a mass of data which is being analyzed to attempt to discover a more positive means of selection of combat soldiers. The development of classification instruments for joint use of all three of the services has been begun. The Over-all Efficiency Index, was put into operation in September 1951 to improve the officer efficiency reporting system. By the end of fiscal year 1953, a new officer efficiency report will be ready for field use. The opening of new officer candidate schools has renewed the emphasis on improving selection instruments. The use of measures of personality during initial classification is now being studied. Greater emphasis will be placed on the development of new criteria of performance, such as measures of success on the job and in the school.

BUDGET PROJECT 1630—SUPPORTING RESEARCH IN PERSONNEL OPERATIONS

Fiscal year 1951, $30,000; fiscal year 1952, $80,000; fiscal year 1953, $130,000.

The purpose of fund requirements under this project is to explore existing statistical techniques and develop new techniques so that data may be analyzed more efficiently and economically. Most of this work in fiscal year 1951 and fiscal year 1952 has been done under "Project 1510—Personnel operations." The increasing amount of work makes it more imperative to find faster methods for collection and analysis of data. New machines and techniques, such as electronic calculators, abacs, and nomographs, will be developed in the field of psychological statistics.

BUDGET PROJECT 1640—BASIC RESEARCH IN PSYCHOLOGY

Fiscal year, 1951, none; fiscal year, 1952, $40,000; fiscal year, 1953, $80,000.

The purpose of this project is to study the basic theory underlying the operational problems encountered in military personnel management. Establishment of such basic theory can lead to substantial sav-

ings in applied research. Basic research in fiscal year 1951 was conducted under project 1510. In fiscal year 1952 and fiscal year 1953, research is planned in the study of basic personality variables, the methodology of criterion development, and the fundamental dimensions of certain intellectual traits. The increased amount in the budget for fiscal year 1953 is due to the ever-increasing need for basic research in the search for fundamental principles of human behavior upon which all applied research in personnel operations is based.

Mr. SIKES. Thank you for your presentation. I want to quarrel with you a little, General Maris, for presenting figures in the form of $0.03 million ($30,000), or $0.08 million ($80,000) or $0.13 million ($130,000). I should like you to present those figures in such form that we will know exactly what you are talking about without having to refigure them mentally while you are making your presentation.

General MARIS. Very good, sir.

BUDGET REDUCTION IN ADJUTANT GENERAL'S OFFICE RESEARCH

Mr. SIKES. You are asking less money over all than you received for the current year. Does that mean actually a reduction, or are you shifting projects somewhere else?

Dr. RUNDQUIST. It is an actual reduction. Our total figure is reduced from about $1,600,000 to about $1,200,000.

Mr. SIKES. It is, then, an actual reduction. How did you achieve it? Are you completing projects?

Dr. RUNDQUIST. We are completing projects.

Mr. SIKES. Are you doing your work with less people, or in what way are you making savings?

Dr. RUNDQUIST. We are completing some of the projects we were undertaking in terms of the Korean emergency. That is the reason we built up our budget during those years. It is now being reduced again.

Mr. SIKES. Do you need less money than you needed for a comparable period before the Korean war began, or is there any way of making such a comparison—that is, on the need in your present operations as compared with the need during a similar period before the Korean war?

Dr. RUNDQUIST. The needs for our work have always existed.

Mr. SIKES. I am talking about a comparison between the need now and the need in the period before we had the Korean war.

Dr. RUNDQUIST. Whoever planned our organization apparently did a pretty good job. Our personnel ceiling has remained at 170 practically since we have been in existence. The reason for lower expenditures in some years has been inability to obtain properly qualified personnel. We are having more success in obtaining personnel. That accounts for the fact that we are now able to utilize a larger budget effectively.

Mr. SIKES. Does this represent all new money? Do you have any carry-over of money from previous budgets?

Dr. RUNDQUIST. You mean for 1953?

Mr. SIKES. Yes.

Dr. RUNDQUIST. There is nothing being carried over to 1953.

Mr. SIKES. How much of this is for new projects that will begin in 1953 and how much of it is for the completion of projects already in operation?

Dr. RUNDQUIST. That is a little hard for me to answer, sir, since at least 50 percent of our work, if not more, goes into the maintenance and improvement of on-going programs. For example, at the induction station, the screening and allociation of men goes on all the time. So we have to work continually to improve those instruments that are in use.

For example, this year, the Terminal Screening Guide was introduced into examining stations. As we dip down deeper into the manpower pool, if we should need full mobilization, we would need still better techniques. It is hard to say what is new and what is old, because we are always working on Army personnel needs and problems of a continuing nature.

Mr. SIKES. Is all of the money you are asking for 1953 research money, or is some of it operational money?

Dr. RUNDQUIST. It is research money.

Mr. SIKES. Mr. Riley, have you any questions?

Mr. RILEY. No questions at this time..

Mr. SIKES. Mr. Scrivner——

LINES OF RESEARCH IN THE ADJUTANT GENERAL'S OFFICE

Mr. SCRIVNER. I am going to have to get a little course in education here to understand what you are talking about. Exactly what is a screening program for full mobilization?

Dr. RUNDQUIST. The screening program for full mobilization involves the Armed Forces qualification test which is now in existence as a screen and a stand-by program of nonverbal tests which can be introduced as soon as needed.

Mr. SCRIVNER. What is the Armed Forces qualification test?

Dr. RUNDQUIST. The Armed Forces qualification test is a test of general learning ability which is given at the Armed Forces examining station level, the induction station.

Mr. SCRIVNER. What does it do?

Dr. RUNDQUIST. It screens men for acceptance or rejection into the Armed Forces.

Mr. SCRIVNER. Upon what grounds?

Dr. RUNDQUIST. On ability or inability to profit from training that can be given them in the military service.

Mr. SCRIVNER. In other words, by this test, whatever it is, you determine whether, in your opinion, a man is capable; what it amounts to is, can he learn? It's not what he knows.

Dr. RUNDQUIST. That is right.

Mr. SCRIVNER. How do you determine, what test do you apply, to determine whether he can or cannot?

Dr. RUNDQUIST. The tests we apply had a long history in civilian life, before they were introduced into the Army in World War II. The way we determine their worth is to study the scores men make on them in relation to their success in various Army training programs and on Army jobs.

Mr. SCRIVNER. Scores that they have made or that somebody else has made?

Dr. RUNDQUIST. Scores that they have made. We arrive at a set of standards from studying one group and apply them to the new men.

Mr. SCRIVNER. You say here in your statement, "Alternative forms of five tests of Army classification battery were constructed."

What is that?

Dr. RUNDQUIST. That is the battery of tests used at the reception center level. Ten tests are given to the Army recruit, the inductee, for classification purposes. The scores on those tests go on his Form 20, and follow the enlisted man throughout his entire career. His admission into the various schools in the Army is determined in part by the scores that he makes on these tests; a good many of his other assignments are also determined in terms of these test scores. Also these tests serve as a preliminary screen for officer candidate school.

Mr. SCRIVNER. What do you mean by "alternative forms of five tests"?

Dr. RUNDQUIST. Even new and improved tests unfortunately become obsolete after a while and have to be constantly replaced, so we develop what we call alternate forms to substitute for them.

Mr. SCRIVNER. What do you mean by "research leading to a revised driver-selection program was two-thirds completed"?

Dr. RUNDQUIST. That research involved going out to a great number of motor pools and getting ratings and information on the value of the various drivers from a safety point of view. Who are the accident-prone drivers, and who are not? Then, after we have these ratings we give these men a wide variety of tests. We find out the scores on the tests by the men who are considered safe drivers as opposed to the men who have had accidents or who are considered unsafe drivers. Tests that separate the two groups are what we are looking for.

We are now at this point in making the analysis. When we have the analysis, by statistical techniques, we will combine the best tests into the most efficient battery. At the present time there is in operation a series of tests for driver selection, but they are very old and obsolete and badly in need of improvement. On the basis of this study we hope to replace them with a new and improved battery.

Mr. SCRIVNER. So that when you get through with this research, which has one-third more to go, you will have certain tests which you can give to the incoming selectee by which you hope to determine whether or not he would or could become a safe driver?

Dr. RUNDQUIST. That is right, sir. We hope to increase our batting average in predicting success as a safe driver.

Mr. SCRIVNER. That is for military vehicles?

Dr. RUNDQUIST. That is right.

Dr. SCRIVNER. What does the next sentence in your statement mean:

Principles of measurement were applied to the development of tests of small unit effectiveness and a manual to aid units in construction of such tests completed.

There must be something else that should be in there?

Dr. RUNDQUIST. I am sorry; it was a matter of having to condense so much into a short space. The Army has the problem of evaluating its small units for effectiveness. For that matter, it has the problem of evaluating units of any size.

Mr. SCRIVNER. What do you mean by small units?

Dr. RUNDQUIST. In this case a squad, a reconnaissance squad. It was studied first to apply the method. The methods that we have found suitable in building tests for individuals were applied in developing a test for a squad—different squads, can then be compared in terms of their readiness to perform their mission. One of the principles we emphasize is to have what we call a reliable test so that two umpires observing the squads will agree in the way they evaluate them.

The Army has received this extremely favorably. We were hardly able to get this research under way before they took it and put it into operation. They found it valuable for their training purposes, whereas we were interested in it from another point of view.

Mr. SCRIVNER. What is your Terminal Screening Guide for use in detecting malingerers?

Dr. RUNDQUIST. The Terminal Screening Guide is a manual which is to be used as an interviewing guide by personnel at the examining stations. It contains, among other things, a test which was developed to predict success in basic training. If a man is able to do well on this test, the chances are that he will make a good soldier. The Guide also stresses the kind of evidence that might raise questions about his motivation on the tests given earlier in the program.

Mr. SCRIVNER. How does that tie in with this other study, consideration of which we were asked for this morning on morale and motivation?

Dr. RUNDQUIST. The Adjutant General has been in this business of personnel research since about 1939. We were the major, if not the only psychological group in the Army. Our office worked on problems that were of importance to the Army at that time and, because of lack of time and personnel, we were not able to study systematically problems of morale, motivation, or training. We worked largely in the areas of classification, assignment, and selection. The other areas have been neglected. For that reason, I assume, provision has been made for research in them.

Mr. SCRIVNER. What has been done in connection with the development of classification instruments for joint use of all three of the services?

Dr. RUNDQUIST. After the Unification Act, our office in conjunction with the comparable offices in the other services decided that we would get together and build what we call a common set of instruments that can be used by all of us to meet common requirements. We did this in the interest of efficiency.

Mr. SCRIVNER. What do you mean by the word "instruments"?

Dr. RUNDQUIST. Tests, specifically classification tests. They are the type of test that are used at Army reception centers. One of the uses for such a program is this. Suppose we, in the Army, want to send an enlisted man to a Navy or Air Force school. We have set our standards comparable with a similar Navy or Air Force test so that he does not have to take the Navy or Air Force test. He could go directly in terms of our own standards. You can see how that would lead to more efficient operation.

Mr. SCRIVNER. You mean that the Navy will accept your tests and your findings?

Dr. RUNDQUIST. That is right. We are working on a common set of tests to serve purposes common to the three services.

Mr. SCRIVNER. I wish they would do that in other fields.

Dr. RUNDQUIST. We would accept theirs, too.

Mr. SCRIVNER. Then you say in your statement that the purpose of the requested $130,000 is to explore existing statistical techniques and develop new techniques so that data may be analyzed more efficiently and economically.

Dr. RUNDQUIST. Perhaps I may illustrate with a project that is now under way. We have a contract with General Electric to develop a technique to be used for a quicker solution of a statistical problem, which we call factor analysis, which is a device for reducing—this gets very difficult, I know, and I will try to be as clear as I can—it is a device for reducing all the possible ways you can look at human behavior, down to a few basic variables. That is, instead of having some 25,000 tests, such as are in existence at the present time, we would like to find out which are the basic dimensions in human behavior, so that we could reduce them to, say, 20 or 40, or even 100 tests. Once we had a battery like that, it would be much simpler to apply our techniques on a large scale and would be much more efficient.

This factor analysis technique is very laborious and takes a long time to apply.

We are hoping that we can explore its fruitfulness in a few instead of many years by getting such a machine. And that is what I mean by developing more efficient techniques.

One other example. We have developed a method in our own statistical shop whereby now one person with machine methods can produce as many of a certain statistic as 35 men formerly did in the same period of time.

Mr. SCRIVNER. Is that one reason why you have been able to cut down your request for funds?

Dr. RUNDQUIST. That helps, sir.

Mr. SCRIVNER. Would there be any reduction in your civilian personnel through that?

Dr. RUNDQUIST. We do not anticipate any, sir.

Mr. SCRIVNER. How does your $400,000 reduction come about?

Dr. RUNDQUIST. The reduction comes largely in contract money.

Mr. SCRIVNER. In other words, you are not going to make as many contracts with outside institutions?

Dr. RUNDQUIST. That is right.

Mr. SCRIVNER. As you have in the past?

Dr. RUNDQUIST. That is right, sir.

Mr. SIKES. Thank you very much.

General MARIS. Next is Col. A. W. Lyon of the Transportation Corps who will present the Transportation Corps budget.

TRANSPORTATION CORPS, RESEARCH AND DEVELOPMENT

Mr. SIKES. Are you ready, Colonel Lyon?

Colonel LYON. Yes, sir.

Mr. SIKES. Will you proceed, please?

TOTAL RESEARCH BUDGET FOR TRANSPORTATION CORPS

Colonel LYON. Mr. Chairman and gentlemen of the committee, for research and development during fiscal year 1953. Transportation Corps requirements total $5,930,300, as compared with $6,260,600 in 1952 and $4,494,000 in 1951.

TRANSPORTATION CORPS RESEARCH ON SUPPLY AND MAINTENANCE PROBLEMS

The major part of the Transportation Corps budget for fiscal year 1953 is concentrated under budget project 1320—"Supply and maintenance operations."

Fiscal year 1951, $4.1 million; fiscal year 1952, $5.6 million; fiscal year 1953, $5.3 million.

OTHER TRANSPORTATION CORPS RESEARCH

Other budget projects include—1150, "Land combat," support of; 1630, "Supporting research"; 1640, "Basic research."

Fiscal year 1951, $0.3 million; fiscal year 1952, $0.6 million; fiscal year 1953, $0.7 million.

The relatively small segment of the Transportation Corps budget comprising these latter three projects will provide for basic and supporting research in fields for which the Transportation Corps has development responsibility.

The transportation Corps research and development program in support of the general Transportation Corps mission embodies the acquisition of commercial equipment and its adaptation to military needs, and further the orderly development of additional necessary equipment which does not exist today.

SCOPE OF TRANSPORTATION CORPS RESEARCH

Briefly, the proposed research and development budget for fiscal year 1953 embraces six areas of exploitation. They include the four means of transportation: Motor transport, air, marine, and rail; and two related fields: The terminal operations involved in cargo and personnel transfers from one medium to another, and a category of special developments.

These areas visualize, in their scope, operation not only in the domestic regions but in every region abroad where we may conceivably have to conduct military operations.

The standardization of matériel is a paramount requirement. This requirement has evolved a program of standardization throughout the planning. Under way today is the standardization of two military rail transportation fleets. Two fleets are needed because foreign rail operations demand both a basic narrow-gage fleet and a basic broad-gage fleet. While railways throughout the world often differ in their gage one from the other, basic rail fleets to accommodate themselves to several gages can be and are being constructed. The research, study, evaluation, and development of these two basic and standardized fleets is continuing.

The funds allocated during fiscal year 1953 will pursue this development through the final testing of equipment. They will be within their respective gage groups, interchangeable and economical to maintain and will require minimum stocks of spare parts.

Similarly, small marine craft are being studied and developed with standardization in mind. We have two basic marine fleets. They are the harbor-craft fleet, which is essential to the efficient operation of water terminals and harbors, and the inland-waterways fleet, designed to enable us to furnish transportation support over the canal and river systems of the world.

During World War II, and in the more recent past, our marine fleet has included craft of many assorted types, sizes, makes, and components. This wide variation in types has created high operational and maintenance costs. It has resulted in less than efficient usage.

The harbor-craft fleet is being standardized to conform with operational and economic requirements. This program is well in progress.

The inland-waterways fleet is a major item on the development agenda. A thorough study has been made of the inland waterways of all nations. From the findings of this study, the requirements for a standard inland-waterways fleet have been cataloged and carefully laid down. The fleet shall incorporate high-capacity craft that can negotiate shallow river waters, deep and swift-running streams, landlocked lakes, and the networks of canals in all countries.

Certain items for both standardized fleets are already developed, produced, and under test. Other items are in design, and others are being planned. This important project will continue and money from the fiscal year 1953 funds allocated will continue the work toward successful conclusion.

Accessory to development of our basic marine fleet we have a particular opportunity for the intelligent application of materials, particularly reinforced plastics, substituting for those that are in critically short supply. The practicality of using such substitute materials in small marine vessels has been proved commercially and is now under test for military marine craft. Several small boats and barges for both the harbor craft and inland waterways fleets are presently being designed to utilize plastic materials. Commercially produced plastic vessels have shown themselves to be durable and adequate.

Further, they show evidence of eventually proving more economical than wood or metal craft in many instances. Plastic hulls require less maintenance, are less subject to the ravages of heavy use and deterioration in water and in storage, and by prolonged lack of maintenance, and are readily and simply repairable. Our fiscal year 1953 program provides for phased development of plastic designs and construction within the practical limit of present application.

In the terminal operations field, Transportation Corps requirements must give consideration to cargo-handling devices. The speed, efficiency, and economy by which cargo is handled at terminals after discharge from ship, plane, railway, or truck is of utmost importance in military operations. Much of the cargo-handling equipment used by the Armed Forces is developed initially by commercial manufacturing firms. Before acceptance by the military, it must be determined by actual service and field testing whether or not this equip-

ment is suitable to the more rigorous service in military logistical operations and what special adaptations are necessary. For this reason, the Transportation Corps research and development program incorporates provision for purchase and adaptation of such equipment and for thorough test trials, modification, and final acceptance.

Whereas private industry can usually select its scene of operation, an army frequently cannot. These exigencies then dictate a need for special equipment of a nature for which there is no commercial requirement but which may and can decide the trend toward victory in a military campaign. In this category, the Transportation Corps research and development program embraces the development of a means of mass-off-road transportation able to negotiate desert, marshy lands, swampy terrain, and other off-road conditions. Such an off-the-road means of transportation for mass movement of cargo is now under study and in initial phases of development.

In this connection our investigations have enabled us to solve one area of this problem by direct application of commercial equipment, proved commercially in heavy hauling operations over the sands of Arabia. Conclusive tests of the adaptability of this equipment to military application in desert situations are planned for this summer at the Army Desert Test Center. This is a fair example of how we seek to increase our transport capabilities by taking advantage of commercial and industrial experience wherever applicable with a minimum expenditure of appropriated funds for original or duplicating development.

Off the record.

(Discussion off the record.)

Colonel LYON. To summarize, the Transportation Corps research and development program for fiscal year 1953 is designed to complete development and tests of the new basic rail and marine fleets; to continue investigations into and development of improved cargo-handling gear and equipment and of terminal-operations facilities and equipment; to intensify research into improved methods and equipment for carrying out the Transportation Corps mission in those areas in which we are presently least prepared to operate; to continue research and development leading to the use of substitute materials for those that are more critical; and, finally, to continue research and investigation into the application of new types of power to transportation usage.

Mr. SIKES. Thank you, Colonel. That was an interesting statement.

REDUCTION IN REQUIREMENTS FOR TRANSPORTATION CORPS RESEARCH

Mr. SIKES. How do you propose to make a saving of $400,000 this year?

Colonel LYON. That is primarily because we have accomplished the major redesign of our postwar fleets. That was our principal problem that faced us in the previous years.

Mr. SIKES. You think the job you are charged with is essentially done and you are beginning to taper off. Is that right?

Colonel LYON. On that phase of it, sir; we have attacked our problem essentially in three phases. First, to put ourselves in a proper postwar position with the fleets and equipment with a minimum

number of components and a maximum amount of standardization. Having accomplished that, both simultaneously with it and subsequent to it, then we have attacked those areas in which we are least prepared to function and operate, such as terminal-operations facilities, such as our disembarking and tramway operation.

Mr. SIKES. Is there a saving in operating costs or is the saving in contract operations?

Colonel LYON. The saving is in contract operations.

Mr. SIKES. Is there any reduction in personnel?

Colonel LYON. No, sir.

Mr. SIKES. Is there an increase in personnel?

Colonel LYON. Yes, sir.

Mr. SIKES. How much?

Colonel LYON. Fifty-eight people. That is because our original development, the end items, will be coming off the line in 1953, and we will require test personnel for the tests on those.

Mr. SIKES. How much of this budget is for personnel?

Colonel GRIGGS. It is $1,138,100.

Mr. SIKES. What was the figure for 1952?

Colonel GRIGGS. $836,000.

Mr. SIKES. How many people did you have in 1952, that is, civilians?

Colonel LYON. One hundred and seventy-two.

Mr. SIKES. And you are asking for?

Colonel LYON. For 230.

Mr. SIKES. That is about a 25 percent increase. What are you going to require those additional civilians for if you have largely accomplished your primary mission?

Colonel LYON. Those are primarly, sir, for tests of the equipment which is coming off the lines. That equipment has been designed and built by contract.

Mr. SIKES. Do you conduct your own tests rather than having them done with contracting funds?

Colonel LYON. Yes, sir.

INTERCHANGEABILITY OF RAIL FLEETS

Mr. SIKES. What are the gages of interchangeable rail fleets?

Colonel LYON. We need only to build two rail fleets. There are essentially seven gages of rail used in the world—three gages in the narrow-gage field and four gages in the broad-gage field.

Countries throughout the world and even within the same country have many gages, so that we are ready to operate and do not have to prepare to have seven gages of rail power. We have two.

Mr. SIKES. Tell me about the steps being taken by other countries in this field. Are we doing research for everyone?

Colonel LYON. We are doing research for every area. Yes, sir.

Mr. SIKES. For other countries. Do they have their own research or do we carry on research in this field for them?

Colonel LYON. We are leading the way, sir, through the ABC standardization, that is, the American, British, and Canadian standardization.

Mr. SIKES. Are they doing any work?

Colonel LYON. Essentially none. No, sir; they are following our lead.

Mr. SIKES. If they are doing essentially none, they are depending on us for the job?

Colonel LYON. Yes, sir.

Mr. SIKES. How much is it costing?

Colonel LYON. For the rail program?

Mr. SIKES. Yes.

Colonel GRIGGS. The rail program is costing $1,200,000.

MARINE TRANSPORTATION RESEARCH

Mr. SIKES. Who does your marine research?

Colonel LYON. We do that basically ourselves within our own cognizance and area of responsibility. That is, in harbor terminal operations, and in inland waterways. In harbor terminal operations and in beach operations we also work in coordination with the Navy and with the Marine Corps.

Mr. SIKES. What do you consider you have accomplished in the way of improving terminal equipment?

Colonel LYON. This aerial tramway is our most significant accomplishment. We also have in process portable conveyors in tests and development based upon commercial models, which require a certain amount of adaptation to the military requirements so that they can be used in the field and will remain operable, which is a requirement not common to commercial practices.

Mr. SIKES. Do you consider this a practical development? Are these things easily knocked out of commission? Are they costly or difficult to operate?

Colonel LYON. They are not difficult to operate. They are costly in first cost, but not nearly as costly as full development of a port. Essentially each one of these tramway systems is a two-berth port complete.

Mr. SIKES. With the tramway how long would it take to unload a Liberty ship?

Colonel LYON. About 6 days. A ship can unload essentially as fast through the use of the tramway as it can along a pier side. In connection with the tramway, I think it is of particular interest to point out the use of this barge which is used as a sea terminal to which the ships can tie up and discharge exactly as if they were tied up to a shoreside pier. This barge has been based upon an initial commercial development and was proven in its military aspects last year in one of our northern projects.

Mr. SIKES. As a matter of fact, I have considered this potentially one of the most important developments that I have seen, particularly in view of the fact that we may be denied the use of many ports and harbors in another war through atomic warfare.

Colonel LYON. Yes, sir.

Mr. SIKES. Is that your thinking too?

Colonel LYON. Very definitely, sir. Off the record.

(Discussion off the record.)

Mr. SIKES. What about the size of the bark? You disturbed me somewhat with the size of it. Is it satisfactorily operational in view of its large size?

Colonel LYON. Off the record.

(Discussion off the record.)

Mr. SIKES. What are the comparative dimensions with the duck? Which was used in World War II.

Colonel LYON. Off the record.

(Discussion off the record.)

COMMERCIALLY APPLICABLE TRANSPORTATION CORPS RESEARCH PROJECTS

Mr. SIKES. In all of the projects that you have discussed, and all of the projects you contemplate for fiscal 1953, would you give us some indication of the percentage of the results that would be considered commercially applicable?

Colonel LYON. Well, our basis is the other way around. We are borrowing from commerce to the ultimate, that is, from industry.

Mr. SIKES. Are you trying to get what you can from things that are being produced commercially?

Colonel LYON. Yes, sir. Perhaps in our plastic program we are going a little bit ahead of commercial progress, inasmuch as we are entering into design studies for larger types of plastic craft than are yet produced commercially. In that respect we are stimulating development in that line. We are not alone in that respect.

Mr. SIKES. In the case of plastics, for instance, where there definitely will be commercial advantages in the development of plastics, to what extent is industry carrying the load, and to what extent is industry depending on the Government to carry the load?

Colonel LYON. Industry, so far as I know, sir, is considerably out ahead of us. The manufacturers of plastics, of course, and glass reinforcement. It is a new industry and a vital industry.

Mr. SIKES. In what ways do you take advantage of the developments of industry rather than attempting a complete development at Government expense? Do I make myself clear?

Colonel LYON. Yes, sir. By our contacts with the industrial concerns as to their experience in the use of plastics, maintenance of plastics, and repair of plastics.

Mr. SIKES. Thank you, Colonel.

ARMY FIELD FORCES BOARDS

General MARIS. Mr. Chairman, we have a new item in our budget this year. In the past the charges of the Army Field Forces boards have been in other budgets. They have now been placed in our budget. So at this time I would like to have Colonel Herrod give a brief description of these boards and what they do.

Mr. SIKES. Very well. Colonel Herrod, we will be glad to have your statement.

Colonel HERROD. Mr. Chairman and gentlemen, this is the first time that this activity has appeared in a research and development budget. The Army Field Forces boards were financed from Army training funds prior to the current fiscal year. These boards are five in number, four located in the continental United States and one, the Arctic Test Branch, in Alaska. These units are engaged in conducting user tests of equipment for the type field army. They also review and study

foreign equipment and prepare military characteristics and recommendations for development.

(*a*) Army Field Forces Board No. 1 at Fort Bragg, N. C., conducts user tests of field artillery and its related fire control equipment, communications and electronics equipment, Army aviation and airborne equipment.

(*b*) Board No. 2 at Fort Knox, Ky., conducts user tests of tanks to include weapons and fire control for tanks, wheeled vehicles, engineer equipment and medical equipment.

(*c*) Board No. 3 at Fort Benning, Ga., conducts user tests of all infantry weapons and all individual equipment for the soldier.

(*d*) Board No. 4 at Fort Bliss, Tex., conducts user tests of antiaircraft artillery and its related fire control equipment and of guided missiles.

(*e*) Arctic Test Branch at Big Delta, Alaska, conducts user tests in the Arctic and sub-Arctic. This unit has a group representing each of the Army Field Forces boards in the United States and conducts the Arctic phase of all tests of equipment as directed by the parent board.

The 1953 request of $2,400,000, a slight increase over the 1952 budget of $1,900,000 reflects additional requirements for implementation of desert testing at Yuma Test Station, Ariz., by Army Field Forces Boards 1, 2, and 3.

Are there any questions?

FUNCTIONS OF AND NECESSITY FOR THE BOARDS

Mr. SIKES. Yes. I think we will want to ask you some questions on this.

Now, tell us more about what these boards do and why there is a necessity for them? To me it seems as though this may be just another layer of officialdom with which we could dispense.

Colonel HERROD. Requirements are established by G–3 for items of equipment. The Army Field Forces boards take the equipment after it has been developed and given engineering tests by the Technical Services. We take it back into the field and see if the equipment will fulfill the requirement which was established for this piece of equipment.

Mr. SIKES. You mean this is additional testing under field use conditions beyond that given by the people who developed it and who originally tested the equipment?

Colonel HERROD. Yes, sir.

Mr. SIKES. Why is that not done by the using services rather than by a second test evaluation group, which is what I presume this is?

Colonel HERROD. We are the using service. The Army Field Forces boards test for the using service. The Technical Service are the producing service. They produce it and give it the engineering test to see if it meets the engineering requirements.

Mr. SIKES. After it gets into the hands of the using services it is observed by this board for further information on the usability, durability, economy, and so forth?

Colonel HERROD. To see if it will accomplish the mission required for that item of equipment.

Mr. SIKES. Presumably it was rather well tested before it was turned over to you. How often do you find that it is not what it was reputed to be when the equipment was delivered to you? In other words, does the board justify its existence by its findings?

Colonel HERROD. Yes, sir. It does. They often find that pieces of equipment as they are designed and have been developed will not actually do what they were designed to do, or do not meet the requirements established. They find that changes in design are required, and it is sent back to the Technical Services for the necessary changes.

Mr. SIKES. Are the board's findings final or must they be passed on by still another board?

Colonel HERROD. The board's findings are sent to Army Field Forces R & D section for review after coordination with interested agencies. The R & D section makes their comments and sends them with the board report to R & D G–4, Department of the Army, who makes the final decision and sends it on to the Technical Services for implementation of the requirements set up in the findings and conclusions of the board report.

Mr. SIKES. Some changes in design are now being made in tanks as a result of tests in Korea. This was reported to us by ORO. Did one of your boards figure in those tests, or do you know?

Colonel HERROD. Yes, sir. They did.

Mr. SIKES. Was it your finding that the tank required redesigning in order to meet field requirements?

Colonel HERROD. Yes, sir.

INCREASE IN FUNDS FOR ARMY FIELD FORCES BOARDS

Mr. SIKES. You are asking for a half million dollars more. Is that for personnel, or equipment, or pencils and paper, or what?

Colonel HERROD. This additional half million dollars is to transport equipment and personnel to Yuma Test Station for tests on the desert during the summer. The personnel will remain the same and the rest of the items in the budget are approximately the same as in 1952.

Mr. SIKES. What are the total requests for funds?

Colonel HERROD. Total requests for funds in 1953 are $2,400,000.

Mr. SIKES. Mr. Scrivner.

CREDIT FOR DEVELOPMENT ITEMS

Mr. SCRIVNER. Who is going to get the credit for all of these good things. We were pretty well sold on ORO but now we seem to be told that you deserve the credit for it. You cannot both be right. Where does your job start and ORO's stop, or vice versa?

Colonel HERROD. ORO works in somewhat a different field. We actually work with the equipment itself and actually run a formal test on the equipment. ORO makes observations in the field and research on the equipment as they see it operate, and they do not actually operate the equipment themselves.

Mr. SCRIVNER. That is a comparatively new activity. It would seem to me that with that activity going out into the field and watching how these various items of military equipment perform in the field, it would make it possible to cut some of your activities. All we are

doing now is just putting another layer on top of another layer on top of another layer, and it is costing us more and more and more.

Colonel HERROD. Our tests are made before the equipment goes into production, and based upon findings we may save vast sums of money by not permitting it to go into production. ORO goes into the field after it has been produced and has been operating and used by units in the field.

Mr. SCRIVNER. I thought that was what this user test was supposed to develop. Regarding many of the things that ORO has reported, how did you happen to overlook them?

Colonel HERROD. I think possibly the best answer to that is that in the tank program the tank was put in——

Mr. SCRIVNER. That is the one you go to, but let us take something else.

Colonel HERROD. Any piece of equipment?

Mr. SCRIVNER. Let us take some specific piece of equipment.

Colonel HERROD. We will take radios. Let us take some piece of radio equipment.

General MARIS. You might take artillery, or a gun for example.

Colonel HERROD. We will take a piece of radio equipment. It comes to us as the user, from the Signal Corps. We have established by G–3 a requirement for a radio that will have a certain range; it will have a certain weight and it will have a certain number of channels. It will accomplish certain missions for particular units in the field army. As we get the piece of radio equipment we take it out and see if it meets all of those requirements. That is, if it will meet the range requirement and to see if it has any weaknesses, and whether or not certain types of terrain affect the operation and efficiency of the piece of equipment. Also we see if the channels set up are separate and distinct enough to permit operation in the type of unit for which it was designed. We determine if it is sturdy enough to stand the use in the field army. If it is to be vehicle-mounted we find whether or not it will stand up under the continued vibrations of the vehicle for which is was designed.

We give it all of this testing before it goes into production. We often find weaknesses, and we find oftentimes that it may be sent back for complete redesign of certain parts of it to fit the use for which the requirements were established by G–3.

Mr. SCRIVNER. If it does not meet it, then somebody in R. and D. has fallen down on the job. What happens if it gets into the field? Where does ORO come in on it?

Colonel HERROD. ORO goes into the field after it has gone into production and is given to troops for operation in the theater of operations, such as Korea.

Mr. SCRIVNER. Suppose they find it does not do what it is supposed to do? Who slipped up?

Colonel HERROD. That would be just a little difficult to state and pinpoint any particular individual or agency that might have slipped up.

Mr. SCRIVNER. You see, after these things get into production and if it does not live up to what it is supposed to do when it is turned over to R. and D., then we are out a lot of money.

Colonel HERROD. That is our mission, to try to work out all the bugs before it goes into production.

Mr. SCRIVNER. Of course, I assume that with all due modesty you would probably tell us if you had an opportunity to field-test the M–46 tank that these things would not have been discovered by ORO, or that you would have checked for that?

Colonel HERROD. We certainly would have found and eliminated a great many of those deficiencies.

Mr. SCRIVNER. Would you have gone into the matter of the transmission?

Colonel HERROD. Yes, sir.

Mr. SCRIVNER. All you would have been concerned about was whether it would do what the tankers wanted it to do or not.

Colonel HERROD. When we give it a test——

Mr. SCRIVNER. You would not care whether it had one kind of transmission or another.

Colonel HERROD. Not as to type.

Mr. SCRIVNER. As long as it did the job that the specifications asked for it to do.

Colonel HERROD. Yes, sir. By the time we would have given it the mileage test, which we would give a tank, we certainly would have found those things that would not hold up under the users' requirements.

Mr. SCRIVNER. With all of the years of experience we have had, the tests are already available. They are already available in the hands of R. & D. and everybody else. You have been running these tests since the year one, but we never seem to end. I am getting pretty well fed up on a lot of it.

General MARIS. Sir, every item is tested for acceptability before it is standardized. We will not accept anything that does not pass the tests.

Mr. SCRIVNER. And within 6 months the specifications are changed and that thing is obsolete or obsolescent, and we will start out on something else.

COMPOSITION OF A FIELD FORCES BOARD

Mr. SIKES. Colonel, what is the composition of one of the boards that you listed here?

Colonel HERROD. Board No. 1 is composed of 84 officers, 12 warrant officers, 341 enlisted men, and 67 covilians, or a total of 504.

Mr. SIKES. How are they selected for proficiency in the various items they are going to observe?

Colonel HERROD. For instance, board No. 1 has a certain section that will test field artillery. The record of an individual who is being considered for the board is sent from career management down to the board for consideration. They review his past experience. They review his training. Any special training that he may have had, and based upon the brief of his record he is selected for a test officer or for membership on the board.

Mr. SIKES. Are all items of equipment subject to this test?

Colonel HERROD. Yes, sir. All types of equipment that are to be used in the field army are tested by one of our boards.

Mr. SIKES. All right. Thank you very much.

Research and Development, Army Security Agency

Mr. Sikes. General Maris.

General Maris. The next item is the last, Army Security Agency. This is all classified. It is a $660,000 budget. I have Captain Overholt here from the Army Security Agency.

Mr. Sikes. This is classified and will be off the record?

General Maris. Yes, sir.

(Discussion off the record.)

Mr. Sikes. Captain, if you do as well with everything as you have done in this presentation, I think you have a fine and useful career ahead of you. I congratulate you, General Maris on Captain Overholt's presentation.

General Maris. Thank you.

Mr. Sikes. Mr. Scrivner.

Mr. Scrivner. My mind was going along the same line. I thought maybe we had better have some more captains sent up here. We might get a better story on some of these things. However, there are two things which you mentioned.

(Discussion off the record.)

Mr. Sikes. Do we have reliable information about the progress made by the Russians in any of the fields that you have discussed?

Captain Overholt. This should be off the record.

(Discussion off the record.)

Mr. Sikes. Thank you, Captain.

General Maris, are you going to present the other witnesses?

General Maris. We have two additional witnesses for the Armed Forces Agencies, which are attached to us for appropriations purposes.

First is the Armed Forces Special Weapons project. Colonel Antes will testify for this agency.

Research and Development, Armed Forces Special Weapons Project

Mr. Sikes. I presume you want this off the record?

General Maris. Yes.

Mr. Sikes. Do you have a statement for the record?

Colonel Antes. I would prefer to have it off the record.

(Discussion off the record.)

Mr. Sikes. Does that complete your presentation?

Colonel Antes. Yes, sir.

Mr. Sikes. Mr. Scrivner, do you have any questions?

Mr. Scrivner. No.

Mr. Sikes. Thank you very much.

Research and Development, Armed Forces Security Agency

Colonel Clark. Sir, if I may proceed off the record?

Mr. Sikes. Of course.

(Discussion off the record.)

Colonel Clark. That completes my presentation.

Mr. Sikes. I want to commend you, General Maris, for the manner in which you and the members of your staff have made your presenta-

tion on the requirements for research and development for fiscal year 1953. You made a most interesting presentation and one that has been helpful to the committee.

General MARIS. Thank you very much, sir.

THURSDAY, MARCH 6, 1952.

PROCUREMENT AND PRODUCTION, ARMY

WITNESSES

MAJ. GEN. W. O. REEDER, DEPUTY ASSISTANT CHIEF OF STAFF, G–4
MAJ. GEN. E. L. FORD, CHIEF OF ORDNANCE
MAJ. GEN. G. H. DECKER, CHIEF, BUDGET DIVISION, COMPTROLLER OF THE ARMY
BRIG. GEN. L. E. COTULLA, CHIEF, REQUIREMENTS DIVISION, OFFICE, ASSISTANT CHIEF OF STAFF, G–4
BRIG. GEN. E. L. CUMMINGS, ASSISTANT CHIEF OF ORDNANCE
W. W. STOREY, ORDNANCE COMPTROLLER
I. A. SCHULMAN, REQUIREMENTS BRANCH, FIELD SERVICE DIVISION, OFFICE, CHIEF OF ORDNANCE
COL. S. L. CONNER, ARTILLERY BRANCH, INDUSTRIAL DIVISION, OFFICE, CHIEF OF ORDNANCE
COL. W. L. McCULLA, SMALL ARMS BRANCH, INDUSTRIAL DIVISION, OFFICE, CHIEF OF ORDNANCE
COL. J. E. ENGLER, AUTOMOTIVE BRANCH, INDUSTRIAL DIVISION, OFFICE, CHIEF OF ORDNANCE
LT. COL. C. M. PROSSER, PROCUREMENT CONTROL SECTION, AUTOMOTIVE BRANCH, INDUSTRIAL DIVISION, OFFICE, CHIEF OF ORDNANCE
MAJ. L. D. K. MARTIN, MATÉRIEL DIVISION, OFFICE, CHIEF, CHEMICAL OFFICER
BRIG. GEN. R. S. MOORE, SPECIAL ASSISTANT TO THE ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)
BRIG. GEN. M. H. DAVIS, AMMUNITION BRANCH, INDUSTRIAL DIVISION, OFFICE, CHIEF OF ORDNANCE
LT. COL. W. J. NEWMAN, AMMUNITION SUBSECTION, REQUIREMENTS BRANCH, FIELD SERVICE DIVISION, OFFICE, CHIEF OF ORDNANCE
MAJ. P. E. ATWOOD, PROCUREMENT AND PRODUCTION PLANNING SECTION, AMMUNITION BRANCH, INDUSTRIAL DIVISION, OFFICE, CHIEF OF ORDNANCE
COL. J. A. PETROLINO, GUIDED MISSILES SECTION, AMMUNITION BRANCH, INDUSTRIAL DIVISION, OFFICE, CHIEF OF ORDNANCE

COL. H. N. TOFTOY, ROCKET AND GUIDED MISSILES BRANCH, RESEARCH AND DEVELOPMENT DIVISION, ORDNANCE CORPS

BRIG. GEN. S. R. MICKELSON, SPECIAL WEAPONS BRANCH, RESEARCH AND DEVELOPMENT DIVISION, OFFICE, ASSISTANT CHIEF OF STAFF, G–4

F. A. VICK, ARTILLERY BRANCH, INDUSTRIAL DIVISION, OFFICE, CHIEF OF ORDNANCE

BRIG. GEN. J. D. O'CONNELL, DEPUTY CHIEF SIGNAL OFFICER

COL. W. P. PENCE, COMPTROLLER, SIGNAL CORPS

M. C. WEST, ASSISTANT COMPTROLLER, SIGNAL CORPS

J. N. MONTGOMERY, EQUIPMENT SECTION, REQUIREMENTS BRANCH, PROCUREMENT AND DISTRIBUTION DIVISION, OFFICE OF THE CHIEF SIGNAL OFFICER

LT. COL. S. K. EISIMINGER, REQUIREMENTS BRANCH, SUPPLY DIVISION, OFFICE OF THE ASSISTANT CHIEF OF ENGINEERS FOR MILITARY SUPPLY AND PROCUREMENT

W. KALLIO, REQUIREMENTS BRANCH, SUPPLY DIVISION, MILITARY SUPPLY AND PROCUREMENT, OFFICE, CHIEF OF ENGINEERS

COL. J. GLORE, SUPPLY AND PROCUREMENT DIVISION, OFFICE, CHIEF OF TRANSPORTATION

MAJ. GEN. G. J. NOLD, DEPUTY CHIEF OF ENGINEERS

BRIG. GEN. A. I. MARSHALL, ACTING ASSISTANT FOR ADMINISTRATION, OFFICE OF THE QUARTERMASTER GENERAL

LT. COL. J. J. SHAUG, REQUIREMENTS POLICY BRANCH, DISTRIBUTION DIVISION, OFFICE OF THE QUARTERMASTER GENERAL

LT. COL. A. W. RITCHINGS, SPECIAL ASSISTANT TO THE CHIEF OF SUPPLY CONTROL, OFFICE OF THE QUARTERMASTER GENERAL

MAJ. C. W. KIRK, SUPPLY BRANCH, SUPPLY AND PROCUREMENT DIVISION, OFFICE, CHIEF OF TRANSPORTATION

J. T. JACKSON, BUDGET SECTION, PLANNING AND CONTROL BRANCH, SUPPLY AND PROCUREMENT DIVISION, OFFICE, CHIEF OF TRANSPORTATION

COL. L. W. ANDERSON, RAILWAY TRANSPORT SERVICE DIVISION, OFFICE, CHIEF OF TRANSPORTATION

LT. COL. H. F. McFEELY, HARBOR BOAT BRANCH, TERMINAL SERVICE DIVISION, OFFICE, CHIEF OF TRANSPORTATION

J. MINDELL, FISCAL DIVISION, OFFICE, CHIEF OF TRANSPORTATION

Amounts available for obligation

	1951 actual	1952 estimate	1953 estimate
Appropriation or estimate			$3,684,520,000
Transferred (pursuant to 63 Stat. 585) from—			
"Quartermaster service, Army," regular supplies of the Army		$51,576,274	
"Transportation service, Army"		233,522,435	
"Signal service of the Army"		656,468,529	
"Engineer service, Army"		147,740,018	
"Ordnance service and supplies, Army"		6,591,227,053	
"Chemical service, Army"		28,377,338	
"Army National Guard"		3,400,000	
"Organized Reserves"		612,142	
"Expediting production, Army"		1,000,000,000	
Adjusted appropriation or estimate		8,712,923,789	3,684,520,000
Balance transferred (pursuant to 63 Stat. 585) from—			
"Quartermaster service, Army," regular supplies of the Army		6,500,000	
"Signal service of the Army"		2,507,760	
"Ordnance service and supplies, Army"		795,477,111	
"Chemical service, Army"		1,162,782	
"Expediting production, Army"		499,507,230	
Reimbursements from other accounts		2,435,000	569,235,000
Obligations incurred		10,020,513,672	4,253,755,000
Comparative transfer from—			
"Quartermaster service, Army," regular supplies of the Army	$63,369,016		
"Transportation service, Army"	149,127,250		
"Signal service of the Army"	756,996,893		
"Engineer service, Army"	424,179,719		
"Ordnance service and supplies, Army"	5,018,077,291		
"Chemical service, Army"	29,531,798		
"Organized Reserves"	3,020,463		
"Army Reserve Officers' Training Corps"	373,791		
"Expediting production, Army"	600,492,776		
Total obligations	7,045,168,997	10,020,513,672	4,253,755,000

Obligations by activities

Description	1951 actual	1952 estimate	1953 estimate
Direct Obligations			
1. Weapons	$2,459,308,813	$4,269,863,143	$442,592,000
2. Vehicles (noncombat)	723,387,050	1,377,718,072	166,261,000
3. Electronics and communication equipment	725,633,976	549,894,223	225,909,000
4. Ammunition and guided missiles	1,841,170,694	2,121,340,420	2,558,561,000
5. Other major procurement	492,540,556	472,779,678	235,695,000
6. Army aircraft	118,120,364	60,786,073	36,107,000
7. Provision of production facilities	600,492,776	1,099,507,230	
8. Industry preparedness measures	82,104,303	66,189,833	19,395,000
Total direct obligations	7,042,758,532	10,018,078,672	3,684,520,000
Obligations Payable Out of Reimbursements From Other Accounts			
1. Weapons	2,240,674	2,260,000	38,945,000
2. Vehicles (noncombat)	14,420	15,000	144,650,000
3. Electronics and communication equipment			750,000
4. Ammunition and guided missiles	155,371	160,000	373,090,000
5. Other major procurement			11,250,000
6. Army aircraft			550,000
Total obligations payable out of reimbursements from other accounts	2,410,465	2,435,000	569,235,000
Total obligations	7,045,168,997	10,020,513,672	4,253,755,000

Obligations by objects

Object classification	1951 actual	1952 estimate	1953 estimate
Total number of permanent positions	$20,007	$28,764	$20,045
Average number of all employees	13,691	22,257	18,104
Deduct number paid from project order funds	13,691	22,257	18,104
Average number of employees paid from 01 Personal services			
Average salaries and grades:			
General schedule grades:			
Average salary	$4,131	$4,590	$4,590
Average grade	GS-6.4	GS-6.6	GS-6.5
Crafts, protective, and custodial grades:			
Average salary	$2,389	$2,756	$2,755
Average grade	CPC-3.1	CPC-3.1	CPC-3.0
Ungraded positions: Average salary	$3,190	$3,097	$3,097
DIRECT OBLIGATIONS			
01 Personal services:			
Permanent positions	$45,245,337	$70,509,731	$61,498,724
Regular pay in excess of 52-week base		321,615	296,550
Payment above basic rates	5,960,637	7,028,165	4,195,357
Total personal services	51,205,974	77,859,511	65,990,631
Deduct amounts financed from project orders charged to object classes 07, 08, and 09	51,205,974	77,859,511	65,990,631
Net personal services			
02 Travel	78,345	76,070	30,000
03 Transportation of things	18,643,256	19,268,076	15,017,000
07 Other contractual services	677,443,829	1,161,169,545	18,750,000
08 Supplies and materials	1,903,802,456	2,159,218,350	2,559,161,000
09 Equipment	4,442,790,646	6,678,346,631	1,091,562,000
Total direct obligations	7,042,758,532	10,018,078,672	3,684,520,000
OBLIGATIONS PAYABLE OUT OF REIMBURSEMENTS FROM OTHER ACCOUNTS			
03 Transportation of things			7,540,500
08 Supplies and materials	155,371	160,000	375,903,750
09 Equipment	2,255,094	2,275,000	185,790,750
Total obligations payable out of reimbursements from other accounts	2,410,465	2,435,000	569,235,000
Total obligations	7,045,168,997	10,020,513,672	4,253,755,000

Analysis of expenditures

	1951 actual	1952 estimate	1953 estimate
Unliquidated obligations, start of year			$9,418,078,672
Obligations incurred during the year		$10,020,513,672	4,253,755,000
		10,020,513,672	13,671,833,672
Deduct:			
Reimbursable obligations		2,435,000	569,235,000
Unliquidated obligations, end of year		9,418,078,672	9,352,598,672
Total expenditures		600,000,000	3,750,000,000
Expenditures are distributed as follows:			
Out of current authorizations		600,000,000	250,000,000
Out of prior authorizations			3,500,000,000

Summary of direct obligations by activity

Activity No.	Title	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1100	Weapons	$2,459,308,813	$4,269,863,143	$442,592,000
1200	Vehicles (noncombat)	723,387,050	1,377,718,072	166,261,000
1300	Electronics and communications equipment	725,633,976	549,894,223	225,909,000
1400	Ammunition and guided missiles	1,841,170,694	2,121,340,420	2,558,561,000
1500	Other major procurement	492,540,556	472,779,678	235,695,000
1600	Army aircraft	118,120,364	60,786,073	36,107,000
1700	Provision of production facilities	600,492,776	1,099,507,230	0
1800	Industry preparedness measures	82,104,303	66,189,833	19,395,000
	Total direct obligations	7,042,758,532	10,018,078,672	3,684,520,000

Activity: 1100 Weapons

Direct obligations by project and subproject

No.	Project and subproject	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1110	Artillery	$325,910,768	$355,282,147	$123,349,430
1120	Small arms	13,541,347	74,255,116	3,028,652
1130	Tanks and combat vehicles	2,118,977,805	3,834,764,880	315,509,918
(1131)	Tanks	(1,494,275,002)	(2,635,542,599)	(97,122,750)
(1132)	Combat vehicles	(624,702,803)	(1,199,222,281)	(218,387,168)
1140	Chemical weapons	878,893	5,561,000	704,000
	Total, direct obligations	2,459,308,813	4,269,863,143	442,592,000

Activity: 1200 Vehicles (noncombat)

Direct obligations by project and subproject

No.	Project and subproject	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1210	Noncombat vehicles	$723,387,050	$1,377,718,072	$166,261,000
	Total direct obligations	723,387,050	1,377,718,072	166,261,000

Activity: 1300 Electronics and communications equipment

Direct obligations by project and subproject

No.	Project and subproject	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1310	Electronics and communications equipment	$725,633,976	$549,894,223	$225,909,000
	Total direct obligations	725,633,976	549,894,223	225,909,000

Activity: 1400 Ammunition and guided missiles

Direct obligations by project and subproject

No.	Project and subproject	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1410	Chemical ammunition	$24,552,046	$22,372,278	$2,118,000
1420	Ordnance ammunition (including guided missiles)	1,816,618,648	2,098,968,142	2,556,443,000
	Total direct obligations	1,841,170,694	2,121,340,420	2,558,561,000

Activity: 1500 Other major procurement

Direct obligations by project and subproject

No.	Project and subproject	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1510	Other major procurement	$492,540,556	$472,779,678	$235,695,000
	Total direct obligations	492,540,556	472,779,678	235,695,000

Activity: 1600 Army aircraft

Direct obligations by project and subproject

No.	Project and subproject	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1610	Army aircraft	$118,120,364	$60,786,073	$36,107,000
	Total direct obligations	118,120,364	60,786,073	36,107,000

Activity: 1700 Provision of production facilities

Direct obligations by projects and subproject

No.	Project and subproject	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1700	Provision of production facilities	$600,492,776	$1,099,507,230	

Activity: 1800 Industry preparedness measures

Direct obligations by project and subproject

No.	Project and subproject	Actual, fiscal year 1951	Estimate, fiscal year 1952	Estimate, fiscal year 1953
1810	Industry preparedness	$82,104,303	$66,189,833	$19,395,000
	Total direct obligations	82,104,303	66,189,833	19,395,000

GENERAL STATEMENT OF THE DEPUTY ASSISTANT CHIEF OF STAFF, G–4

Mr. SIKES. General Reeder, it is a pleasure to have you back with us this morning. We are ready to have you talk about procurement and production, a very big item, and a very important item. We shall be glad to hear what you have to say about it.

General REEDER. Thank you. I have an opening statement, which, with your permission, I shall proceed to read.

Mr. SIKES. Very well.

(General Reeder read as follows:)

EVENTS UNDERLYING THE PROCUREMENT AND PRODUCTION ESTIMATE

Mr. Chairman and gentlemen, the procurement and production appropriation provides the Army with the major end items of armament. You will note that the programs into which it is divided show an apparent difference in emphasis as far as the amounts of money requested are concerned. This disparity arises in part from the methods followed in computing and adjusting these estimates, and in part from the conflict in Korea. As you will remember, the appropriation for 1952 was requested and made on the assumption that the conflict in Korea

would cease on June 30, 1951. It did not so cease. We have, therefore, been engaged through the past seven and a fraction months in carrying on a war on credit. By credit, I mean diversion to the support of the Korean conflict of assets which were intended to be mobilization reserve. The largest consumption of hard goods in war is ammunition, and in Korea the rates of ammunition usage have been higher than obtained in any theater in World War II. Consequently, while production has been slowly building up, we have dug deeply into the residual ammunition stocks of World War II, and have in some items, exhausted it. The ammunition program reflects this condition by requesting some $2.559 billion or about 69 percent of the entire appropriation request. Our schedules for ammunition production reach their maximum levels generally in the late spring or early summer of this year, and we must maintain those high levels of production for some time. First because we have a very considerable reduction in our war reserve to recover, and second, should Korea continue or any other combat be joined, we should have to subsist very largely from the production line because of the depleted condition of our reserve stocks.

METHOD OF COMPUTING THE PROCUREMENT AND PRODUCTION ESTIMATE

I think it is desirable to explain now, before we consider any individual item or even category of items, the process by which the quantities set forth in this request were calculated. The calculation of requirements is made with the aid of a Form 519–b. This approach was worked out with the Department of Defense over a year ago in order to bring the services to a similar basis in the calculation of requirements, and to afford on a single page, a summary statement of requirements for any given item. If you will follow me with the form before you, you will see that we show the name of the item, and the name of any item which can be substituted for it, either for training purposes, or in some cases, across the board. There is also shown the reorder lead time and the Department which effects procurement.

Proceeding to the actual calculation of requirements, we list first the combat consumption, namely, the wear out and loss of the item in Korea. For fiscal year 1951 the quantity used will be the actual consumption; for fiscal year 1952 it will be a calculated combat consumption. The factors used in making this calculation will be the best obtainable, namely, the factor derived from 1951 operations, or lacking that, the World War II factor, adjusted if it appears desirable.

The next item of gross requirements is the initial equipment for the regular forces, and for the civilian components. For the regular forces the calculation is made by cross-multiplying the allowances of the items for each organization by the number of such organizations in the troop basis, and adding them up. In some cases an item may be used not only in a tactical organization but in equipment of a supporting post or station. In such cases a further entry would be made under "installation support." There are also special allowances in certain cases for training which would be shown opposite the item "training." Such would be the equipment furnished schools and replacement training centers. There is a further item, "all other," which has occasional application. For example, we have maintained at White Sands in New Mexico for several years, a research into guided missiles. In the process of flying the experimental missile there have been needed radar sets, radio sets, and much other equipment, none of which is covered by any table of organization and equipment. The needs of this project would obviously be listed opposite the words "all other." The next item to be considered is the Civilian Components.

(Discussion off the record.)

The allowance here is 10 percent of the full T/E in terms of modern equipment. Another 40 percent is allowed but the requirement is met by the substitute item so far as it is available. This 50 percent allowance for the civilian components is based upon the experience that troops can be trained successfully with approximately 50 percent of the equipment which they must have in war. Since the guard and its accompanying units from the guard and Reserve would be mobilized and trained for some time before going overseas, this is considered sufficient provision.

(Discussion off the record.)

In the next major heading, "Peacetime consumption," there is entered the actual consumption for 1951 and the predicted consumption for fiscal year 1952 and fiscal year 1953. In order to supply troops it is essential that there be a pipeline of material extending from the depots through transportation facilities

to the depot stocks closer to the troops, and thence until the items reach the hands of the user. For overseas support, and for combat as well, the time length of this pipeline is 6 months. Consequently, if in line 1b we anticipate a consumption of 1,000 items in Korea during fiscal year 1952, we must provide a pipeline of 6 months, or 500 items, in order to furnish the user the item when he needs it. For troops in the United States the level of supply, or pipeline, is 3½ months long.

We come next to the calculation of the mobilization reserve for the first year of war. nI doing this we calculate really not the reserve but the gross requirement. The first item covers the forces which are to go overseas over and above the existing active Army during the first year of war. Obviously some of these troops will be National Guard and Reserve Corps units. However, they must be fully equipped with modern matériel; we provide for that here and plan that they shall leave the equipment with which they trained for the use of the troops mobilized shortly after they have sailed. The next item is the combat and training consumption. Here we have calculated the average number of troops and units overseas during the first year, and the expected consumption by them, using World War II rates. Similarly, we average the number of troops in training in the United States during the year, and multiplying by the expected rate of consumption in training, arrive at this requirement. In order to supply these requirements for consumption we again must maintain levels of supply. As before these are 6 months for overseas and 3½ months for the Z/I. From the total so derived we deduct the pipeline shown under lines 4a and 4b.

The next requirement is for what we call class IV material. This is the type of stuff which is not covered by T/E, and the usage of which depends to a great extent upon the locale of the war. For example, the building of roads in rear areas requires earth moving equipment, so does the construction of airfield. The units which might do this work have the necessary equipment as part of their T/E, but should we utilize indigenous civilian labor to any extent, the equipment is not covered. Found in this category also are such items as materials handling equipment, landing craft and prefabricated buildings, the demand for which has to be estimated on the basis of the locale of the war and of its nature.

After completing the last entry we have stated all of the gross requirement and we total it in line 7. The next step is to deduct from this gross requirement the assets which consist of the world-wide inventory or stocks on hand, and quantities for which appropriated funds have already been made available toward meeting the requirements. Subtracting these assets we then have the net requirement of the item.

It is in deciding what part of the net requirement should be budgeted, and what should remain unbudgeted, that the reorder lead time at the top of the page becomes of interest. Take the case of the medium tank in which the reorder lead time is 12 months. This means that from the day you order a tank you must wait 12 months before you get delivery. Consequently, if you order tanks on the first day of a war none of those so ordered will do you any good until the first day of the second year of the war. Hence, you should provide all of the medium tanks that you will require in the first year of the war prior to declaring war. These tanks may be on hand or they may be on order and scheduled for delivery during the first year; preferably there should be some of both so that there will be a production line in existence. Should, however, the reorder lead time of the item be only 6 months we can get 6 months production during the first year of the war by orders placed on the first day, and a goodly part of this production can be done at higher rates than obtained in peacetime. Calculating what we might thus expect to get by orders placed on D-day or immediately subsequent thereto, we determine the number of the items which would be left unbudgeted and enter that quantity in line 9b; the remainder of the net requirement should be budgeted and is entered in line 9a.

We went through the process which I have been describing with checks and counterchecks to arrive at the original procurement and production estimate which we made in preparing for this budget request.

(Discussion off the record.)

Of the total money calculation which we made at that time, 96 percent has been covered by the Form 519 process which I have just described. Although we made very liberal allowance for the production to be anticipated as a result of orders placed on D-day, the total estimate for this appropriation came to $8.6 billions.

Remember that although this was a very conservative estimate and accepted large risks in the area of expanding production after D-day, it was essentially a requirements estimate.

(Discussion off the record.)

It did not take into account the effect which the necessary peaking of production would have upon the country's economy, nor did it give effect to some slippages which have occurred. The size of the over-all budget request, the impact of the necessary procurement upon the country's economy, and the fiscal problems involved as well as many other considerations, caused a review of the Department of Defense estimates, and as part of that review, this request for appropriations has been reduced to $3,685,000,000, or less than half of the original request. To pad out this rather limited fiscal provision it is planned to reprogram for procurement $400 millions of funds originally intended for the purposes of creating production base; the delays in securing machine-tool deliveries will permit this to be done without grievous hurt at this time.

FISCAL YEAR 1953 PROCUREMENT AND PRODUCTION PROGRAM

It will be well to examine exactly what this appropriation request is planned to accomplish and what the over-all effect will be. The cost to this appropriation of the Korean conflict in fiscal year 1952 approximates $2.8 billion. Since those costs were not provided for in the fiscal year 1952 appropriation, they are now being covered by this request. The 1953 appropriation is, of course, expected to cover the normal fiscal year's expenditure for ammunition for training and for the wear out of equipment. For an Army of the size we now have, this approximates $1 billion. Adding that to the Korean cost, the total is greater than the appropriation request before you. It follows then that with the provision of these funds we will have less than met the Korean and current operating costs and will have made no further advance in this appropriation toward the achievement of a war reserve beyond that which you had already provided in the fiscal years 1951–52 appropriations. That is the over-all financial effect. However, in order to carry on with a reduced amount, we are scheduling out our production over longer terms than originally planned. In many lines, therefore, the funds which you provided in the two past fiscal years will have to carry production through all or a large part of fiscal year 1954. In some cases the procurement needs of the Mutual Security Assistance program can be added to our funds to maintain good production but in many lines the rate of production will be low.

(Discussion off the record.)

In the stretch-out of delivery from production there were some lines which, because of slippage and for other reasons, could be maintained through lead time into fiscal year 1954 with the funds programed from fiscal years 1951–52 appropriations. Such is the case of the medium tank. The light tank, on the other hand, could not maintain a production line without additional funds, and we are therefore requesting further funds for it. The most prominent category in which the fiscal year 1951 and 1952 funds are insufficient to maintain production and to recover the inroads made upon existing reserve is ammunition. In this category we estimate that expenditures in Korea, plus training consumption during fiscal year 1953, will amount to $2,409,000,000, or approximately 65 percent of the entire appropriation requested.

The remainder of the appropriation is utilized almost entirely as I have described to fill out the financing of items already in production, and for the continuation of those production lines for which our fiscal year 1951–52 program funds are insufficient, or to finance the beginning of production of items not hitherto financed. An example of the latter is guided missiles.

(Discussion off the record.)

PROCUREMENT AND PRODUCTION OBLIGATIONS

Before embarking upon the detailed discussion of the estimates, I should like to say a word about obligations. The original requests of fiscal year 1952 were very sharply reduced—such a reduction inevitably throws the relations between parts of the program out of balance. In addition, the fiscal year 1952 budget, even as originally calculated, did not contemplate continuance of conflict in Korea, and because the conflict did continue, we had to reprogram and reschedule the funds which were made available. This was a far greater task than we originally conceived it to be. In addition, it was done at a most unpropi-

tious time. If you will recall, the great majority of the procurement funds made available to the Army in fiscal year 1951 were appropriated in January of that calendar year. Consequently, we were engaged in a tremendous effort in the ensuing 6 months to put that money to work in national defense by obligating. The record of obligation for that period was impressive but it left the personnel engaged in it much more ready for a rest than for a new and even more difficult effort. Besides that, the speed with which we had acted entailed of itself loose ends. For example, we made large use of letter orders. These had later to be converted into firm contracts and the conversion required a great deal of painstaking negotiation, a very great deal of what my friend, General Christmas, calls "whereas trouble." So it came about that our rather tired personnel were confronted simultaneously with the task of cleaning up after the 1951 procurement, of reprograming the 1952 procurement, and of trying to carry on a necessary minimum fiscal year 1952 procurement with the funds provided us under the continuing resolution. The reprograming effort, which included approvals by the Department of Defense through its Comptroller and through Munitions Board, was not completed until September. The full appropriation, as you know, was not passed until October 18, 1951. The rate of obligation is disappointing, but I believe the circumstances I have just recited do much to explain it. Obligation has, however, begun to pick up and I believe that we will make the goal of sensibly obligating the funds we now have available. The greatest damage that we could have done by this is to postpone the delivery of goods which we sorely need. However, because of the slippages incident to the start-up of production it is doubtful that much damage has occurred in that way. There can be no question, however, as to the necessity for the goods which the unobligated money represents. We must obligate the money and we must have the goods for the defense of this nation.

There is another reason which I have not cited which has produced slow obligation, and that is the attitude of procurement personnel, and of the contractors with whom we deal. The contracting officer for the Government does not occupy a particularly enviable position. He is charged with very great responsibilities and is compelled to exact from contractors compliance with a considerable number of statutes which do not affect business people in their normal relations with one another. Over the past few months a few cases, remarkably few in the light of the number of our people engaged in procurement, and involving sums which are trifling when compared with the over-all responsibility, a few cases I repeat, have come to light in which the procurement personnel did not measure up to the Army's standards of conduct. The ensuing hue and cry has tended to impugn the integrity, the common sense, and the industry of every man engaged in our procurement. These people are now gun-shy and they are perhaps more interested in being sure that their "skirts will be clean" than in pushing procurement as rapidly as might be. American business, on the other hand, finds very little financial incentive in seeking Government business. We endeavor to hold contractors down to a lower rate of profit than they are accustomed to make on their normal commercial operations. In addition to that, the Government oppresses them, in their opinion, with a multitude of regulations and compliances from which they are normally rather free. Finally, there is no great compelling urge of patriotism similar to that of a full-scale shooting war in the situation we now find ourselves. The position of the average American businessman at this time might be well described as it was by Mr. Samuel D. Willis, who represented seven or eight manufacturers in dealing with the Army. He says, and I quote:

"The Government, in effect has given him (the manufacturer) the choice of utilizing his machine tools for civilian business, sans renegotiation, sans red tape, and sans Government interference, or of using them for defense contracts, with renegotiation, with red tape, and with Government interference * * * the Government cannot adopt a lethargic, business-as-usual, arms-length, no-assistance, help-yourself, red-tape policy and expect industry to respond with a spirit of urgent, life-or-death, wartime patriotic fervor."

We subscribe it is in this atmosphere of quasi-peace that we must work and far from being apologetic for the fine people who are trying to do our procurement, I am proud of the over-all job that has been done, and am confident that the present problem of slow obligations can be overcome.

In summary, the estimates for this appropriation have been reduced to a minimum by considering every factor which might tend to bring about a reduction, regardless of the increased risk of unpreparedness thus accepted. The funds requested in this appropriation will not increase the capabilities of the

Army above those which you provided in the fiscal years 1951–52 appropriations; and it will not achieve those capabilities as soon as you expected when you made those appropriations. However, this appropriation will permit the Army to fill the interstices of our planned production schedules so that we will incur a minimum of damage in the all-important production base for the most essential combat items. Lest you be misinformed, let me reiterate that with the limited amount contained in this request, plus the balances from prior year funds, the Army will be unable to continue each and every production line at its presently planned rate through reorder lead time into fiscal year 1954; some production lines must be reduced to a minimum going rate; a few must stop altogether. We anticipate that the requested funds will avoid undue hiatus in industry; it is the bare minimum amount essential to provide continuity and avoid this hiatus.

Mr. Chairman, I can either pause for general questions at this time or proceed with the appropriation.

Mr. SIKES. I think we should have some general questions at this time, General Reeder. Before that I want to say that I think you have made a very good and most helpful statement. It contains a lot of valuable background information which our record needs. I am appreciative of the fact that you have given us this thorough discussion of the over-all picture.

Mr. SCRIVNER. And, may I add that he has made a very good plea as counsel for the defense.

FISCAL YEAR 1953 ESTIMATE FOR PROCUREMENT AND PRODUCTION

Mr. SIKES. For procurement and production for the fiscal year 1953 you are asking for $3,684,500,000. That is $6,334,558,000 less than you had in fiscal year 1952 and $3,358,238,000 less than in fiscal year 1951.

Am I to assume from that that you have done a thorough job of scaling this program down in order to keep it within the actual minimum of the matériel that you feel you must have?

General REEDER. That is the case, sir. We have been successively confronted in reaching this point by personnel whose purpose was to reduce the appropriation request just as far as it could be done and it has been reduced by taking a considerable risk, to this figure.

Mr. SIKES. As you pointed out, your major item in all of this program is ammunition. If ammunition acquisition is further reduced, am I to assume that there may be actual danger that we will run out of ammunition?

General REEDER. Yes, sir. I would like to continue off the record, if I may.

Mr. SIKES. Very well.

(Discussion off the record.)

Mr. SIKES. I assume that none of this request anticipates a continuation of the Korean war beyond the current fiscal year, 1952?

General REEDER. That is correct, sir. Should the conflict go on, or should we even have a partial continuation, we will continue absorbing the cost temporarily from war reserve or by reprograming and then come back to ask you to foot the bill.

Mr. SIKES. Should the Korean war continue beyond this fiscal year and into the fiscal year 1953, do you anticipate that there may be a further dangerous reduction of ammunition stocks beyond that which we can meet by the production program for the fiscal year 1953?

General REEDER. No, sir. The ammunition situation would be roughly this. We have provided here for bringing ammunition back into line. Major production, however, will begin——

Mr. SIKES. Are you stepping up ammunition production?
General REEDER. Yes, sir.
Mr. SIKES. During 1953?
General REEDER. Nineteen fifty-three is when we will really get ammunition delivered.
(Discussion off the record.)

ORIGINAL REQUEST FOR PROCUREMENT AND PRODUCTION

Mr. SIKES. How much money did you originally ask for procurement and production?
General REEDER. Eight and six-tenths billion dollars.
Mr. SIKES. What major fields of equipment or supplies were deleted?
General REEDER. Of course, it went across the board; it was scaled back everywhere, but the largest single item was the removal of nearly 5,000 medium tanks.
Mr. SIKES. Why?
General REEDER. We, of course, have met with delays because of tooling and engineering difficulties when going so rapidly into production with the medium tank, so that actually the 1951–52 money will last longer than we originally expected.
Mr. SIKES. Are you going to be able to operate satisfactorily on $3,684,500,000?
General REEDER. Barely.
Mr. SIKES. That would indicate that you asked for far more than you needed originally?
General REEDER. No, sir. May I go off the record for a moment?
Mr. SIKES. Yes.
(Discussion off the record.)
Mr. SIKES. Now, some general questions in order that we may find places where we can assist you to make further economies, General Reeder.

STATUS OF DESIGNS IN PRODUCTION

Generally with respect to major items of equipment, are the designs which are now in production all proven designs?
General REEDER. No, sir.
Mr. SIKES. Does that mean you are gambling on some of them?
General REEDER. To some extent.
Mr. SIKES. Will you discuss that?
General REEDER. The situation in the design matter is that some of the equipments which we have in production stem from our research and development effort in the years following the war. In 1946 it was quite widely felt that we had entered upon a long period of peace in which there might be tension, but it was a tension which might be resolved; that capitalism and communism might live together without clash. The research and development programs were not only cut back from the war but they were rescheduled to a lower rate, and intended to come to fruition in end items in anywhere from 5 to 10 years.
The objective was not the immediate change and improvement, but a longer term one: in fact, we specifically forbade the making of minor improvements on existing equipment.

So that when the Nation was aroused to its position, which I would say was roughly around July 1, 1950, that being the date on which we were popped at 4 o'clock and at 5 o'clock we did not strike back as fast as had been said, we had to manufacture equipment. Since we had to set up a base, the question was, should it be set up for World War II equipment or should we try to take advantage of the research and development that had been going on since the war? We took the latter alternative and did it with our eyes wide open.

Mr. SIKES. In what major items of equipment are you in production, on unproven weapons?

General REEDER. The tank which we are producing, the medium tank, had never been put together as a unit as it is now being done.

Mr. SIKES. I understand that you ran into some trouble there and you are now working out of that trouble?

General REEDER. That is correct, sir. In fact, we went beyond. We manufactured the M–46 tank, and it was proven in Korea. It is a good tank.

Mr. SIKES. What other major items of equipment?

General REEDER. Without continuing the M–46, we went to the 47 which we think is a better tank or will be a better tank. I am not sure that it is not a better tank today but, in putting the improvements into the 47 which were not in the 46, we had some untried things and found a lot of minor deficiencies. It was an experience that we had during the war, it is nothing new, but it is very maddening at times; it is discouraging and, of course, affords the armchair critic every opportunity to strike telling blows. But we must accept those criticisms and go ahead, because we are fundamentally right.

Mr. SIKES. You were trying deliberately to save time there. But in what other major fields are you producing unproven equipment?

General REEDER. Electronic equipment, in the radio field.

Mr. SIKES. Are the cases similar, so that you are taking a deliberate gamble to save time?

General REEDER. That is correct.

Mr. SIKES. Do you think the gamble has been justified?

General REEDER. I do.

Mr. SIKES. By the time that you have saved?

General REEDER. I do. We would have been in production no sooner or very little sooner on World War II equipment, because the tools and everything with which we made that World War II equipment had been dissipated. We had to set up, reassemble personnel, find the contractors, and get back through the whole process.

STATUS OF PRESENT PROCUREMENT ORDERS

Mr. SIKES. Do you have firm contracts in effect for the items that are now being produced?

General REEDER. Except for new ones just coming in; yes, sir.

Mr. SIKES. When you say new ones just coming in, you mean new ones that are just coming into production for field, or for test use?

General REEDER. Both. For example, in this estimate we have a new tracked vehicle called the infantry assault vehicle, I believe it is. It has been waggishly called Ontos, being Greek for the "thing."

That is new. We hope that it will fill a need and will prove a cheap substitute for the T–18.

Mr. SCRIVNER. What are you doing about the T–18?

General REEDER. We are continuing the manufacture of it. We have to have something to fill that gap.

ADEQUACY OF PRODUCTION EQUIPMENT

Mr. SIKES. Are you completely satisfied that needed production equipment is on hand to carry out the proposed 1953 schedule?

General REEDER. Yes, sir. I have not any doubt about the 1953 schedule. We are coming along. We even have had a bit of luck. This paint fire in the Ford factory was at the best end of the factory in which it could have occurred.

Mr. SIKES. It did not do too much damage?

General REEDER. It did not do anything like what we feared.

Mr. SIKES. What was the loss there?

General CUMMINGS. It was, as I recall it, about 25 percent of the structural area and a little under a million dollars worth of miscellaneous production equipment. But fortunately most of that was relatively short lead time and Mr. Harter has insisted that this fire will not delay his original plans.

Mr. SIKES. Was that fire from sabotage or was it accidental, or do you know?

General CUMMINGS. I do not know whether the investigation has been completed, sir.

Mr. SIKES. You are investigating?

General CUMMINGS. Yes, sir; it is being investigated by the Ford Motor Co.

Mr. SIKES. Was it's appearance of a suspicious nature?

General CUMMINGS. I have no personal knowledge of it, sir. I have only telephone reports.

Mr. SIKES. I think this committee would be interested in knowing what you learn or what the investigation shows.

General REEDER. We can get that and put it in the record at this point.

(The information requested is as follows:)

CAUSE OF FORD FIRE

Locale of fire was Ford main tank plant building at Lavonia, Mich.

Fire began between 8 and 8:45 p. m., February 29, 1952. Duration of fire was approximately 2 hours with major portion of damage being done in the first hour.

Building was damaged to approximately 30 percent of floor area. Cost of damage is estimated at $5,000,000. Facilities procured for Government account in the approximate amount of $300,000 had been moved into the area and were involved in the fire. Condition of these facilities is unknown at this time, there being required for such determination their complete or partial disassembly. No personnel were injured.

It is estimated by qualified Ordnance personnel that Ford's portion of the tank program will be retarded approximately 3 months. Ford optimistically has indicated that if they can get the rebuilding action they anticipate, the program will not be delayed.

Cause of fire is unknown. There is no evidence of sabotage. Contractor's shanties; contractor being Darin & Armstrong, general contractors, Detroit, were possessed of coal stoves with smoke pipes. One of these shanties which was destroyed is suspect as the starting point.

At the time of the fire the plant did not have full water protection. Ford's fire plumbing was installed and ready for use; however, the municipal water mains had not, at the time of fire, been brought up to Ford's property line. It is estimated that necessary extension of municipal water service will be accomplished within 30 days.

Above information resulted from a meeting between Ordnance and Ford investigative personnel at Detroit ordnance district offices, March 11, 1952. The Ford Co., the FBI, Ordnance, and other interested agencies have been conducting investigations since the fire took place. Investigation will continue and more complete reports will be submitted at a later date.

Mr. SIKES. Mr. Small made this statement to the committee on January 28:

While machine-tool shipments are now picking up well over the low postwar levels and are currently running at about the rate of $800 million per year, there is still a backlog of almost 2 years at current shipment rates,

which would indicate a fear on his part that there was not needed production on hand. Am I to assume that that does not apply to your shop?

General REEDER. It does and it does not.

Mr. SIKES. Why do you say that it does or does not?

General REEDER. We can use profitably more machine tools than we can operate successfully with. In other words, the rest that we expect to get will improve our production base but because of the slowing down of the schedules we will not now require as many machine tools as we expected. We can make out.

PURPOSES OF THE PROCUREMENT AND PRODUCTION PROGRAM

Mr. SIKES. You have two purposes in this program—to procure weapons and to develop the production potential. Also, as I see it, you have two major factors affecting procurement: changes in improvement and design, and shortages of critical metals.

I ask this question: In the light of continuing improvements should we further slow down the procurement program in order to conserve critical metals for the more improved designs and concentrate more on expanding our production potential?

General REEDER. You cannot do one without the other. A production potential exists only if it is used. If we are to have a production base it has to be manufacturing something. We must be buying from it or it ceases to exist.

Mr. SIKES. That would not prevent you from slowing down.

General REEDER. We have already in this program slowed down about as much as it possibly can be, except in ammunition.

Mr. SIKES. In the current 1953 program you said that you have slowed it down.

General REEDER. Yes, sir; but that starts as of now. I am in the middle.

Mr. SIKES. Does that mean you built up a base which is able to take care of greater production at this time and in fiscal 1953 than this budget would permit?

General REEDER. No, sir. Because of this reduced 1953 budget we are now engaged in rescheduling all our procurement and deliveries so that the presently available funds plus these will carry us through reorder lead time into 1954.

Mr. SIKES. So you answer that the conservation of critical materials plus the fact that a slowed-down schedule of production which would permit more improvements to be incorporated in production as production continues, would not be justified at this time?

General REEDER. It would not.

Mr. SIKES. And that you are now at what you consider to be about as low a minimum as you safely can follow?

General REEDER. That is correct, sir.

Mr. SIKES. Is that your answer?

General REEDER. That is my answer. That is, except for ammunition. We can manufacture much less ammunition, as far as that is concerned.

Mr. SCRIVNER. All types, or certain types?

Mr. SIKES. You mean physically you can manufacture less ammunition, or that safely you can manufacture less ammunition?

General REEDER. No. We could maintain a production line with less ammunition being manufactured, but we could not safely support the defense of the country with less.

LEAD TIME REQUIREMENTS

Mr. SIKES. Do you expect any improvement in your present estimates of lead time? Do you think you are through with the trial and error period and that you know pretty well what you are doing, or are you going to cut the lead time down further?

General REEDER. No. sir. I do not think you will cut it down greatly.

Mr. SIKES. What are some of the major obstacles to shortening lead time?

General REEDER. The first obstacle in dealing with lead time is the assumption on the part of those who do not know the game that the lead time is the time from when a manufacturer has a signed contract until he turns out production. That is not the case. Even though we have a contract today with, let us say, Chrysler, or any company—it does not matter—if we want to add to that contract or make a supplement to it, or give him a new contract, whichever it turns out to be, it is in the nature of things a new contract. A contract is a meeting of the minds at the time it is made. There are very few contracts which in their life do not prove to be more advantageous to one party than to the other. So when one endeavors to make a new contract on the same terms, one party or the other says, "No" and there follows a period of negotiation.

It is not possible as many of our armchair strategists would like to think, that on July 1 money is appropriated, on July 2 it has all been obligated, and the lead time is from July second until we get production. If we were to operate our business in that way, all our procurement people would do something fabulous for a couple of days and then go hunting, or something else, the rest of the year. So there is a considerable period that we call administrative lead time—the time of getting the program well formulated and checked and into the hands of the procurement people for their negotiation, for the review of the contracts when the contractor refuses to accept our normal policy as applicable to him, all this takes a great deal of time. Du Pont is a nice example. We wanted Du Pont to operate a powder factory. We had

to have that powder factory in operation or we were going to run out of powder. The negotiation in a crude form started before we had any money, but it began soon after January 1951, did it not?

General CUMMINGS. Late spring, sir.

General REEDER. I did know the dates once. Late spring. Let us say April or May. The final contract after all the legal obstacles, and so on, had been brushed away, was January, I believe.

General CUMMINGS. I do not have the date, but I can get it.

(The information referred to is as follows:)

Formal negotiations with Du Pont for the operation of Indiana Arsenal, plant No. 1, for the production of single base smokeless powder began in March 1951. Earlier mobilization planning provided for the selection of this organization in the event of an emergency requiring the operation of this plant. This was a natural selection since Du Pont originally designed the plant and operated it satisfactorily during World War II.

The contract with Du Pont was consummated in January 1952. During the interim negotiations with Du Pont continued. Progress was exceedingly slow, mainly on account of the insistence of Du Pont on a variety of deviations from the standard clauses of the Government contract.

General REEDER. It was a little more difficult in that case than normal, but 8 months were spent in getting a competent manufacturer signed up. It was a plant Du Pont had run before. He was the operator we wanted. The number of operators of powder plants are somewhat limited. The other people to whom we might have turned were already well loaded with contracts, so that it was not a situation in which we could really get competition.

BUILD-UP OF PRODUCTION FACILITIES ON A BALANCED BASIS

Mr. SIKES. On April 27, 1951, the President said in substance that we should hold down the procurement of short-term, easy-to-get items, in order to build up our production facilities on a balanced basis. How does that affect Army procurement?

General REEDER. Well, in the first place, we strike out a lot of things. Take the clothing for a soldier. We do not consider it necessary to have a war reserve of neckties. You can fight a war without a necktie. In the matter of getting an item that you can get fairly quickly we have provided for only enough war reserve to tide us over the period until production can get under way.

As to the time scheduling of items, there is a little fallacy which we discover when we go into the problem. If you were to bring all your production to a crescendo, as you do a symphony orchestra, you would certainly find yourself taking all of the raw materials and critical materials away from the civilian economy. Then when you were shut down, boom. That would be terribly upsetting. So what we are doing now, I think, is a more rational process.

Mr. FLOOD. What are you doing now?

General REEDER. We are getting what we can at the time and we hope to slack off on those when the peak of other items comes later, so that the take of critical materials will remain more sensibly constant.

REASONS FOR EXTENDING PRODUCTION

Mr. FLOOD. General, that is why I just inquired at this point. Your comment with reference to your concern with the production for the civilian economy and the utilization of various raw materials for the

civilian economy, as well as the defense production in which we are now engaged—that kind of thing, I suppose, is the reason given for what is now being called the stretch-out in which we are engaged or about to enter.

General REEDER. Yes, sir.

Mr. FLOOD. You have extended into another fiscal period this production, both civilian and defense.

General REEDER. That is right.

Mr. FLOOD. And the reasons we have been given, or you are indicating, for that is that you have suddenly developed a commendable interest in the civilian economy, realizing that it is important as well as the defense economy, and you have therefore reconsidered this, that, and the other thing, and you are acquiescing in Mr. Wilson's urging that the civilian economy be recognized and that you do not take everything into defense.

Is that the real reason or was it a glaring error either in the budget estimates, which I think is unlikely, or in the production elements? Of course, when I say "the production elements" I am speaking not only of the Army. This program to which you and I are now addressing ourselves concerns the armed services, that is, the three branches, and not just the Army. But for your part of it is the reason for that what you just said or was it not really a very bad mistake made by Budget Bureau and/or the production and procurement shops in the Army and other services?

General REEDER. The answer is neither. To answer you I would like to go off the record.

Mr. FLOOD. Then you mean it is a combination of both?

General REEDER. No, sir.

Mr. FLOOD. It is something else?

General REEDER. Yes, sir.

Mr. FLOOD. All right. Let us have it off the record.

(Discussion off the record.)

Mr. FLOOD. This is an important thing, as far as two areas are concerned, that is, budget estimates and our procurement people. I have a very low regard for some of our procurement people for reasons of which you are not aware, and have nothing to do with what we are talking about, but somebody was wrong in this case. Either you were wrong in magnifying the budget estimates unnecessarily, or, if you were right, the procurement people were not cognizant of our production potential, or the American civilian economy did not dedicate itself properly to the production; but something happened in one of those three areas—budget estimates, military procurement, or the producers of what the procurement people wanted. Somebody made a mistake. I am not convinced that this is because the defense people suddenly became concerned about the importance of the civilian economy.

This is a good statement, and one of the best you ever issued, but I am not sold on it. I think something else happened. Somebody made a bad mistake. Who did it?

General REEDER. The original estimates and the schedules of production and, consequently, the proposed consumption of critical materials, stemmed from the date on which it was decided that full readiness should be attained. I think that the impact of that early date was not fully understood for a long time.

Mr. FLOOD. Let me interrupt to ask, did you fully understand it? We are talking about budget estimates. I mean your area. Let us restrict ourselves to your responsibility. You say that the situation was not fully understood at that time.

General REEDER. By all.

Mr. FLOOD. Was it fully understood by the budget estimate people at that time?

General REEDER. Yes, I think so.

Mr. FLOOD. Then your budget estimates, you say, were made with a full and complete awareness of the international, political and strategic situation as you have been advised it existed?

General REEDER. That is right.

Mr. FLOOD. Then you are passing the buck to the next two areas, that is, either procurement and/or the civilian production part of it?

General REEDER. No; I am not.

Mr. FLOOD. Who gets it?

General REEDER. You have not named the culprit.

Mr. FLOOD. Well, you name him. What other area could there be now? I know who the common enemy is. Do not blame the common enemy for this one now. It is not an act of God or the common enemy, all the JAG officers to the contrary.

General REEDER. Let me repeat: The unrealistic schedules; the large budget estimates which were so cut back in 1952 and 1951; the proposed take of critical materials, arose from an unrealistic assumption as to the date on which the country could be made fully ready for war. Everything else flows out of that.

Mr. FLOOD. You said that off the record in a different way 5 minutes ago.

General REEDER. That still remains the answer. The culprits that you are trying to assign the blame to come later. They were lesser factors. Now off the record for a second.

(Discussion off the record.)

Mr. FLOOD. We are talking about budget estimates now. When you make these budget estimates do I not take it for granted that you have surveyed the attitude of the Procurement people based upon this chart?

General REEDER. Yes.

Mr. FLOOD. This cannot be done without them, can it?

General REEDER. Oh, I do that too.

Mr. FLOOD. But you cannot operate this thing without Procurement people. They are your first consultants on this kind of thing.

General REEDER. No, sir.

Mr. FLOOD. No?

General REEDER. No, sir.

Mr. FLOOD. You just do this as an academic job?

General REEDER. No, sir. This is where you figure out what you need.

Mr. FLOOD. How can you figure out what you need without consultation with the people who are going to get it?

General REEDER. Oh, they will tell me what I can get after I tell them what I would like to get.

Mr. FLOOD. Certainly. After that is done I take it for granted that they have their fingers on all of the potential units of production

in the Nation to get what you can get, based on that estimate. So there is a casual connection between the two.

General REEDER. Oh, yes.

Mr. FLOOD. You cannot give birth to this document without the other two components?

General REEDER. That is right.

Mr. FLOOD. Then the culprit is only in that area. It cannot be anything else.

General REEDER. Perhaps I did not get your original question as well as I might have. Your question after this discussion, if I get it correctly, is this: We have said that because our money is lasting longer and we are stretching out, we have gone way down in our estimates for 1953.

Mr. FLOOD. Wait a minute. Your money is not lasting longer in the appropriations sense, but rather in the expenditures sense.

General REEDER. That is right.

Mr. FLOOD. But why? Why did it last longer and why was it necessary for the figure to last longer? And, if that is so, why were not your budget estimates reduced in the first place?

General REEDER. All right. I have the question possibly a little clearer in mind. The answer is that two of the things which you mentioned are correct, that our estimates of possible production were more optimistic than proved to be true; and that there is some apathy on the part of business as a whole toward our effort. Further, that we have had delays due to engineering changes because we went into production on not fully proven things, which we feel or still think is absolutely the thing to do——

Mr. FLOOD. Then there has been error in the three areas that I mentioned, including your own area?

General REEDER. Yes. Surely.

Mr. FLOOD. That cannot be so casually disposed of as being unimportant, in view of the fact that you are extending the stretch-out through an entire fiscal period, which to all intents and purposes constitutes a mathematical fraction of the 1954 fiscal period. Some part of the 1954 budget requests from your office will be materially affected by this stretch-out; or do you think you are going to keep that money too?

General REEDER. Very little.

Mr. FLOOD. It cannot be very little. Off the record.

(Discussion off the record.)

TIME RELATION BETWEEN APPROPRIATIONS AND PRODUCTION

General REEDER. Take the medium tank. The medium tank is about a 12-month lead-time item. No money that you appropriate in fiscal year 1954 will get you a tank in that fiscal year.

Mr. FLOOD. I know that. You estimate 12 months on the order.

General REEDER. Yes.

Mr. FLOOD. There is nothing new about that. I knew that and you knew it before Korea started.

General REEDER. In reprograming all that we are doing is carrying the production up to the time when a fiscal year 1954 appropriation will pick up the burden.

Mr. FLOOD. We can stay on the merry-go-round for the rest of the morning, but there is no doubt in my mind that at some place, either in the budgeting process or some place else, there has been a very major error made with reference to the programing and the results that will be produced at the end of the 1953 fiscal year. I say that because your contractual obligations and your whole projection of this budget for 1952 to the end of calendar year 1953 is affected.

General REEDER. That is right.

Mr. FLOOD. Now you have stretched it into both fiscal year and calendar year 1954.

General REEDER. That is right.

Mr. FLOOD. Production items and other things are being tagged on a calendar basis at the end of 1954, so we have been told, but you have also stretched your fiscal and budget concept to the end of fiscal 1954—both things. That can only be the result of some kind of major planning or thinking in your office or some place else; or maybe a combination of places.

However, I do not like to think that, if trouble occurs again, we will again run into a panic-budget estimate, a panic concept of production, and a panic procurement, and then a year or two later that we will then say, "Well, we have made a mistake." That is an awful shock on the economy and certainly on the appropriations arm of this part of the Government.

We wonder what you are going to do next. Does that not occur to you at all?

General REEDER. I live with it.

Mr. FLOOD. Then the answer is, yes. Since you have the responsibility for this budget estimate, what do you have to tell us about this budget estimating? This is an excellent presentation, I repeat.

General REEDER. I do not believe you were here when I went off the record to say this.

(Discussion off the record.)

Mr. FLOOD. But do you not see what is going to result in round figures on this stretch-out as between the 1952, 1953 and 1954 fiscal budget which in my judgment will amount to about what the deficit will be, say $5,000,000,000 if that is what it is at the end of this fiscal period. That is because of malplanning some place in this huge budget. It shows up in your area because of the size of your budget. If you extend an error of that many billions over a couple of fiscal periods you are going to reach large percentages.

That is not a very casual thing. Nobody allows that margin for error.

General REEDER. No, but——

Mr. FLOOD. And the Ways and Means people are all upset about taxes.

General REEDER. But I have not found the error yet, sir.

EFFECT OF EXPENDITURES FROM PRIOR YEAR APPROPRIATIONS

Mr. FLOOD. You have found it because you are stretching into 1954 now.

General REEDER. That is right.

Mr. FLOOD. If you had told us this in the first place——

General REEDER. We are not putting any money in this estimate which could be appropriated in fiscal year 1954.

Mr. FLOOD. Of course; but you are taking it for granted that whatever we give you is yours. This is the Army concept of saving money. That is not saving money, even though you have not yet spent it.

General REEDER. No.

Mr. FLOOD. It is on your books and it is on our budget, and everybody has it checked off and it is gone, but it was not expended. You think you saved it. You are wrong, General, from the appropriation point of view.

General REEDER. Are you talking about 1952 funds?

Mr. FLOOD. 1952 and 1953 to the end of calendar 1954, which is half of fiscal 1954. That is 2½ years.

General REEDER. We are not talking about calendar 1954 at all.

Mr. FLOOD. As far as delivery is concerned of what you are going to buy with the dollars you get in 1953, you are.

General REEDER. No, sir.

Mr. FLOOD. Now, if a tank is ordered in calendar year 1952 with delivery in 12 months you might get into 6 months of the next fiscal year. If your lead time is 12 months on tank A ordered in January 1952, to be delivered in January 1953, the same thing is true unless you stop ordering tanks, and I hope you are not going to do that. So you are going to get tanks delivered half-way through calendar year 1954, ordered in the fiscal year 1953. That would be 12-month lead time.

General REEDER. No.

Mr. FLOOD. Yes.

General REEDER. Wait a minute.

Mr. FLOOD. Unless you are going to have the tanks all delivered Monday morning, certainly you are.

General REEDER. No, sir; you do not do that in practice.

Mr. FLOOD. I know you do not.

General REEDER. We would hope to place large orders of that type if necessary by the letter order in July, and complete all the whereasing afterwards, so that the tanks ordered in the case of the light tank here, with 1953 money, the last of those tanks would be delivered in June of 1954.

Mr. FLOOD. That is the end of the fiscal period of 1953?

General REEDER. That is right.

Mr. FLOOD. But you are not going to stop ordering tanks?

General REEDER. No; but they will have to come out of the fiscal 1954 money.

Mr. FLOOD. There is no doubt about that. Appropriated July 1, 1953. What I am concerned about is that this stretch-out which may occur again over a couple of years, amounts to the deficit which is being talked about by statesmen around here.

General REEDER. In other words, what you say is——

Mr. FLOOD. Who made the mistake? If you had estimated $5,000,000,000 less than you did estimate——

General REEDER. In 1952?

Mr. FLOOD. In 1952. Take half of it in 1953. We will allow you that—$2,500,000,000 in 1951, 1952, or 1953. Take any 2 years. It does not matter.

With reference to the Korean situation and with reference to what you should have known about our production potential—and that applies to anybody else in the Army identified with this program—had you known all you should have known or could reasonably have anticipated, then it looks to me as though the budget estimates are responsible for having produced at the end of this fiscal year what amounts to the total budget deficit of $5,000,000,000 if that is what it will be.

The reason I say $5,000,000,000 is because I have heard recently from people who know more about it than I do that $5,000,000,000 is the figure, rather than $14,000,000,000. It may end up at $5,000,000,000. Why I have no idea, but taking that lower figure, if that is true, as the experts say, then the end of this fiscal period would have produced a balanced budget if your office and the Defense people generally had properly handled your budget estimates in the last two fiscal periods.

FORMULATION OF BASIC BUDGET POLICY

Mr. SIKES. Let me get into this picture for just a moment. Is it not true that you do not make the policies on what size force you are to have? You are given that figure. Is that right?

General REEDER. That is right.

Mr. SIKES. And you have to develop your procurement and production figures to meet a target that you have been given by somebody at a higher level?

General REEDER. That is correct.

Mr. SIKES. Is that not the sum and substance of this thing? You are belaboring the wrong witness.

Mr. FLOOD. I do not blame this man here.

Mr. SIKES. You might well talk to the White House and State Department about policy. I think you may have something definitely worth while in your line of questions. We are dancing to the tune of a man named Joe Stalin. Unfortunately he moves here and we have to try to move there to offset him. He makes the decisions which are keeping the world in an uproar and our budget in a mess. He is the fellow who is picking all the target dates and changing them at his whim. Inasmuch as he does not tell us those target dates or policy shifts, we have to guess at them. As a result, we have a pretty badly scrambled budget situation.

However, the people now before us have no choice to do anything except try to have a state of preparedness at a certain level at a certain time. Those levels are given to them by the policy people in the White House and the State Department, and interpreted by top levels of the Department of Defense. Am I right?

General REEDER. That is correct.

General DECKER. May I add something to what you said? It may help to clarify this.

Mr. SIKES. All right.

General DECKER. The requirement for this equipment has never changed. It still exists. That requirement was computed on the

basis of being ready by a certain date. In phasing back that date, it is necessary to phase the deliveries of end items so that they are produced at a later time, but we still need them.

If I may go off the record now?

Mr. SIKES. Yes.

(Discussion off the record.)

Mr. FLOOD. In fairness to the record, I would like to show that I am not suggesting the Army—this man sitting across the table here—is responsible for an overestimate of $5,000,000,000. Under no circumstances. I understand what the chairman meant, and that is so; but there is some responsibility in the budget estimates for the error if my premise is sound. To what extent I do not know.

General REEDER. Yes; you are quite right.

Mr. SCRIVNER. May I ask a question just to see if I can kind of pinpoint this? You come before us making a request for a certain amount of dollars. Now, upon what is that request based?

General REEDER. That is based upon a plan to be ready——

Mr. SCRIVNER. In other words, you need certain things for the amount of troops you are going to have in the field during the coming fiscal year. You also need a certain amount to build up what we normally call a war reserve. Who gives you the criteria upon which you make your estimates?

General REEDER. The Department of Defense.

Mr. SCRIVNER. Who in the Department of Defense makes these decisions as to what your strength is going to be and what your target date for mobilization readiness is to be?

General REEDER. The Secretary of Defense through his assistants, of course, based upon——

Mr. SCRIVNER. The Chiefs of Staff must be in the picture.

General REEDER. The Joint Chiefs of Staff.

Mr. SCRIVNER. The President's office must be in the picture, undoubtedly, inasmuch as the military carries out the administration policy as it relates to international affairs. The Secretary of State's office must be in the picture some place also. All of those are over and above your office, and the decisions they make come down in certain form and in graduated steps to you, upon which you then apply your item and dollar need.

General REEDER. That is correct, sir.

Mr. SIKES. I think that pretty well clears it up. Now let us get back to the procurement of short-term items.

What items with a lead time of 3 months or less are included in this appropriation?

General REEDER. I do not believe we have in this particular appropriation a single item, unless it be——

Mr. SIKES. You are actually emphasizing the long lead time items?

General REEDER. That is correct.

Mr. SIKES. On January 28, again quoting Mr. Small, he said:

> The concept of the current program calls for heavy dependence on the establishment of warm-going production lines rather than attempting to accumulate reserves to full requirements for the first years of war.

I want to ask you this question: Is it the policy under the present mobilization build-up to provide productive capacity for rapid production of equipment without building up a large stockpile?

General REEDER. That is essentially correct, sir.

Mr. SIKES. If this is so, will it be a wise policy to cut back production to the minimum level as soon as the active Army requirements are met?

General REEDER. No, sir; because you would not then have any production base whatever. A production potential is a little like a horse. A horse has a capacity for work but only so long as you feed him. When you stop feeding the production base orders, they stop producing and you no longer have any production base.

Mr. FLOOD. Off the record.

(Discussion off the record.)

AMOUNT OF WAR RESERVE INCLUDED IN 1953 ESTIMATES

Mr. SIKES. You state in your justifications:

In general the sums requested in this justification will not increase the amount of war reserve provided by the fiscal years 1951 and 1952 appropriations.

How do you reconcile that statement to the fact that on some of the items, I believe 15 out of 34 items, for which you furnished this committee additional information, the item is shown to be for mobilization reserve?

General REEDER. The statement is a fiscal statement that over-all in money value we will be no better off than we were because of the 1951–52 appropriations.

Mr. SCRIVNER. How is that?

General REEDER. We will have the same percentage of war reserve reckoned in dollars that you planned when you made the 1952 appropriation, because the 1952 appropriation made no provision for Korea, and we are in this appropriation recovering in dollars the bill for 1952 in Korea plus the normal consumption for fiscal year 1953.

Mr. FLOOD. The chairman asked you a question about production in your pipelines after your normal use is met. I notice in your original statement you indicate that because of the high expenditure of ammunition in Korea you have exhausted certain categories of stores and ammunition.

General REEDER. Yes.

Mr. FLOOD. Of course, you are going to put those back into storage, are you not?

General REEDER. Yes, sir.

Mr. FLOOD. That is what you mean in reply to this question?

General REEDER. That is right.

Mr. FLOOD. You are meeting current need and then your stockpile will be filled up again?

General REEDER. That is correct.

OPERATION OF FORM DD 519

Mr. SIKES. I was interested in your Form DD 519 and your explanation of how it operated. I thought that was very well carried out. However, in order that we might have more specific information and actually see it in operation, I would like for you to take any particular piece of equipment, something like a 5-ton truck, for example, and describe the preparation of a form DD 519 for that piece of equipment.

General REEDER. All right, sir.
Mr. SIKES. For instance, take a five-ton, six-wheel truck.
General REEDER. Yes, sir. This will be off the record.
(Discussion off the record.)

TABLES OF ORGANIZATION AND EQUIPMENT

Mr. SIKES. How do you determine your actual need for this number of trucks? Is it an arbitrary decision on your part that the Table of Organization and Equipment shall be such, or do you follow the results of field experience? How do you determine your need for trucks in these various categories?

General REEDER. The Table of Organization and Equipment is one which is made by a number of people in which we have probably the conservative influence.

Mr. SIKES. That is a bible of service requirements you have been following for a long time. Maybe you are afraid to question the accuracy of its statements. Perhaps it is just something that was handed down to you and you were going to hand it down to the officer following you without questioning its contents. Is that a possibility?

General REEDER. No, sir; because we have been questioning them. It is G–4's interest to hold them down. We have to produce the stuff and we have to fight for the money to get it produced.

Mr. SIKES. How do you follow through and determine that you actually need, for instance, all the trucks in the Table of Organization and Equipment?

General REEDER. The G–3 section of the General Staff is the one who has the primary job on that. They work with Army Field Forces to examine the mission of a division, or a company within that division, as to what equipment they should have. What do they have to have to carry it out? In this case the item is often an ammunition carrier. How many do they have to have? They go at it somewhat with a minimum idea too.

Mr. SIKES. How often are the Tables of Organization and Equipment revised?

General REEDER. How often are they revised?

Mr. SIKES. Yes.

General REEDER. I am giving an answer that is going to be pretty approximate, but I would say in view of the magnitude of the task that they are reviewed with the idea of revision about every 2 years. It is quite a large order.

Mr. SCRIVNER. Have you had any of these outside agencies which we have been hearing so much about, make any studies of the Table of Organization and Equipment, such as ORO?

General REEDER. I think ORO had a look-in in Korea.

Mr. SCRIVNER. Can you find out?

Mr. SIKES. Yes. Will you determine for this committee and tell us whether there have been any such studies, and, if not, the date of the latest revision of the Table of Organization and Equipment?

General REEDER. Our field forces completed not long ago a complete review, and we have had a pamphlet on the subject.

(The information requested is as follows:)

During the post-World War II period, many boards and panels have surveyed the equipment requirements of the Army, particularly with respect to the authorizations for specific type units. Notable among these were the Infantry Conference of 1946 which reviewed the tactics, organization and equipment of the Infantry Division and resulted in innumerable changes in equipment allowances; the War Department equipment board (the Stillwell board) which evaluated World War II experience of equipment requirements as a guide for future research and development; the Army equipment policy panel of 1950; the war games of 1950 which were to determine whether logistic support of a field army in combat, as authorized, was satisfactory; and similar panels such as the Army armored panel, the Army Field Force advisory panel on field artillery, etc.

Up to this time no set period has been established during which TO & E's were required to be revised. Such revisions as were accomplished were based upon the normal functions of the developing agencies in their routine review and upon the results of the afore-mentioned panels and boards.

Present planning within the D/A envisages the complete revision of all TO & E's at least once every 4 years in addition to routine revisions brought about through the normal functions of interested Army agencies.

EFFECT OF KOREAN CONSUMPTION ON THE 1953 ESTIMATE FOR PROCUREMENT AND PRODUCTION

Mr. SIKES. General Reeder, in your justification you state that the 1953 request is based on recouping consumption of equipment in Korea during the fiscal year 1952, and the normal peacetime attrition of the Army's matériel during 1953. Is your figure of combat consumption for fiscal year 1952 in any part Korean consumption?

General REEDER. Yes, sir; that is what we mean, Korean consumption.

Mr. SCRIVNER. May I make an inquiry at this point?

Mr. SIKES. Yes.

Mr. SCRIVNER. Inasmuch as you have included Korean consumption in 1952 and allocated what we thought was going to be spent to build up mobilization reserve, does that mean now that you will not be here asking for a specific supplemental appropriation to make up for the Korean consumption?

General REEDER. On this particular appropriation, no.

Mr. SCRIVNER. The reason I ask is because last year, as I recall it, we discussed Korean consumption, but we were told that it was not included in the budget presentation, that there would be a supplemental later to make up for it.

General REEDER. That is right.

Mr. SCRIVNER. Now, as I understand, under this there will be no supplemental request?

General REEDER. In this particular appropriation; the reason for that—and I was probably instrumental in it—was that I felt that in explaining a long-term program of several years, which is what this procurement business comes down to—it is not just an annual thing—that it would be extremely confusing to try to set forth such a program partly in the regular appropriation and partly in a supplemental.

Mr. SCRIVNER. I think this is a more practical approach. But you recall some of the questions I asked last year about this very thing and we were told then that we could expect to look forward to a supplemental request.

General REEDER. In lieu of making a supplemental request in procurement and production, we have embodied it in this one budget.

Mr. SCRIVNER. It is included in the whole works?

General REEDER. All in this one budget.

Mr. SIKES. If we assume that the consumption figure for combat and peacetime use, shown on your DD–519 sheets for 6 months, is one-half of the total consumption for the fiscal year 1952, why is the budget request less on most items on which we have detailed data than this combat consumption plus the peacetime consumption for 1953?

General REEDER. It is only true generally; that the total money comes to those figures. Included in the total money, for example, is an item of guided missiles, which was scarcely included at all. So what we have done is this. There is an attempt to round out our programs. For instance, take the case of medium tanks. We have asked for no tanks in this particular budget request, so that we are actually worse off by the number of tanks lost in 1952 in Korea.

Mr. SIKES. Then it is not true in all instances that the budget for 1953 recoups the 1952 consumption?

General REEDER. Only as an over-all money figure.

Mr. SIKES. Only as an over-all money picture?

General REEDER. Yes, sir. We affected a new balancing among the items, to the best of our ability, so as to keep the various item programs in step with one another.

Mr. SIKES. I note you are not asking for funds for 90-millimeter tanks; 81-millimeter mortars; sniperscopes, and some other items. Is the same thing true of all of those items that is true of the tanks?

General REEDER. Generally, sir, that is the case. In the case of the sniperscope another reason enters into it. Although it will work, it is still too heavy to please the using troops; it is too heavy to carry up the tops of the hills that they have in Korea and the battery does not last long enough. So we are not manufacturing that. We are not going out for any more of them until we have had one more try at reducing its weight.

Mr. SIKES. Then these are items in which the combat consumption is greater during 1952 than the amount to be financed during 1953?

General REEDER. Yes, sir; that is correct.

Mr. SIKES. No funds in 1953 are requested for Rockets, H. E., 4.5 inches, T–160 E2. Only 726,237 are provided for under 1951 funds, and none from 1952 funds; but 6-months' consumption is estimated to be 699,840 combat and 1,506 peacetime. Why is this item permitted to drop to almost none on hand? If it is to be replaced by other equipment, why do you show an unfulfilled requirement of 2,194,100?

General REEDER. We have internal strife on the 4.5 rocket, as to whether we should continue to have it.

Mr. SCRIVNER. What is it used for?

General REEDER. It is a mass, an area weapon, to saturate an area by blowing off a lot of them at one time.

Mr. SIKES. What is replacing it?

General REEDER. Nothing at the moment. The 6.5 is a possibility.

Mr. SIKES. What is substituted for it?

General CUMMINGS. The old standard 4.5 rocket; I do not recall the M number on it.

Mr. SIKES. This particular rocket has not proved out as satisfactorily as you had hoped?

General CUMMINGS. It had not. For that reason the production of the quantity in last year's budget has been postponed, it has slipped

back about 1 year, to insure that we do have a suitable rocket for production.

Mr. SIKES. But you are still including it in total Army requirements? That seems to get us back to what has been stated more than once, that the Army orders a lot of new stuff, but does not want to give up any of the old stuff. How do you account for the fact that it is still listed in total Army requirements?

General REEDER. Until we have designated a substitute—notice, we are not procuring any of the substitute for it, either—until we designate the new item, there is a requirement for an item even though we cannot fill it for reasons other than money.

Mr. SIKES. Do you estimate that you still need that one or the one that is to take its place?

General REEDER. That is correct.

Mr. SIKES. And at the moment are you marking time to determine which it is going to be?

General REEDER. That is correct, sir.

RELATION BETWEEN PEACETIME CONSUMPTION IN 1952 AND IN 1953

Mr. SIKES. Why, in most instances, is estimated peacetime consumption for 1953 more than twice the consumption for one half of 1952?

General REEDER. I do not believe that that is the case. We show on these 519's the combination of the fiscal years 1951 and 1952, and then the fiscal year 1953. There are some reasons why in certain items the peacetime consumption in 1953 may be greater than the sum of the two previous years, or may be comensurate with it.

In 1951, everything went to Korea and that has continued to some extent into 1952. The Army, other than what was in Korea in 1951, accomplished very little in the way of training. Everything was being shipped to Korea. In the case of some rounds of ammunition, for example, they have not been fired here for training because they have not been available for fire. There are some rounds right now which are going to Korea and practically none are being made available for training.

REHABILITATION AND REPAIR OF EQUIPMENT

Mr. SIKES. To what extent do the consumption or other requirement figures reflect equipment rehabilitated?

General REEDER. We take credit in the inventory for all equipment whether serviceable or unserviceable.

Mr. SIKES. Do you show a monetary value?

General REEDER. No, sir; but it is subtracted as an item in obtaining the net requirement.

Mr. SIKES. Is the repair and rehabilitation program being stressed at this time. or is that rather a side show?

General REEDER. No, sir; it is being stressed. In setting up the rehabilitation program, the number which are counted as assets in these 519's are those which are set up for rehabilitation as the total program.

Mr. SIKES. Do you have some figures to submit for the record on the rehabilitation program in general?

General REEDER. Yes, sir. We can fish them out now or they will come along normally with the maintenance and operation appropriation.

Mr. SIKES. Very well.

UNIT COSTS FOR PROCUREMENT ITEMS

In general are unit costs higher or lower than those estimated for the same item in 1952?

General REEDER. I believe in most essential ones they are higher.

Mr. SIKES. Does that mean higher labor costs or higher material costs? It would appear, as you get into production, that you would have a scaling down of costs.

General REEDER. We hope that should be the case, but in our two most expensive items, we have not gone far enough to get a price redetermination or to acquire the know-how which will bring the price down.

Mr. SIKES. How did you determine the unit costs for the 1953 program?

General REEDER. We have used the last contract price wherever it was available and, lacking that, for new stuff, the best estimate. Sometimes I believe they have been shaded in favor of what we believe will be new costs. Actually they will not show in this 1953 estimate the prices of one of the most important items, the medium tank, because we have none in the estimate. But the price of the medium tank is still, as far as we know, far above the 1952 estimate.

Mr. SIKES. Did you use a price index showing a continuation of the inflationary trend in determining the cost of items for 1953?

General REEDER. No, sir; there has been no prediction of further inflation. Ammunition costs have run generally below the 1952 estimate; not strikingly, but below.

Mr. SIKES. What would be the effect on unit costs if orders were cut back to the minimum production capacity level?

General REEDER. They would go up.

Mr. SIKES. You think unit costs would go up?

General REEDER. Yes, sir.

Mr. SIKES. How much, and why?

General REEDER. The why is fairly simple. The same overhead applies to a smaller number of items. How much the price would go up I think would depend somewhat upon the character of the item. Maybe General Cummings can give a guess here on that score?

General CUMMINGS. I think it would depend more specifically on the actual item, sir. I believe you can, using an available facility, and available management, operating on a three-shift or two-and-a-half-shift basis, do it much more economically than on a one-shift and still more economically than if you reduce your one-shift down to what we might call a bobtail shift.

I do not believe I would be in a position to give an over-all percentage of increased cost.

Mr. SIKES. Do you think there would be a general increase in cost that would apply to virtually all items if you cut back to the minimum production capacity level?

General REEDER. Yes, sir; on any military-type items where we are maintaining the production line with our orders. It will not make any difference as far as buying tractors is concerned, because there we are just another customer.

DEFINITION OF MINIMUM PRODUCTION CAPACITY LEVEL

Mr. SIKES. Why do you not tell me how you would determine the minimum production capacity level? What is your definition of minimum production capacity level?

General REEDER. We have tried to define that as the one-shift operation with a sufficient volume so that the overhead cost per unit will not vary widely from the most efficient operation. The estimates which we receive from the technical services as to what is the minimum are generally so high that we have to discount those. If we were to accept those as the absolute irreducible minimum, our budget based on them would have to be considerably larger. I think General Cummings could give you some feeling testimony as to our differences, concerning a minimum.

General CUMMINGS. I agree with General Reeder on that, sir.

Mr. SIKES. Is there anything further that you wish to submit on that?

General CUMMINGS. Not in general, sir, on that subject.

General REEDER. For example, we had that case with the light tank, which I think is a very nice one. They can produce, without strain, and will do so I believe in the next few months, 200 tanks a month. You can throttle them down I guess to 100 a month without making a too-significant increase in price. Is that a fair statement?

General CUMMINGS. That is correct, sir.

General REEDER. When you start dropping below that 100, then you will begin to notice the matter of price.

Mr. SIKES. Does your minimum production capacity include all units of production which now are operating or would some units have to go out of production?

General REEDER. Some units are going to have to go out. We face that in each of these lines. The statement that we would like to depend upon production potential is perfectly true, but that cannot last forever. In order to have the production capacity, it must be in use and must produce end items. So that as we produce those end items, our requirements go down. Our scheduling plans in quite a few cases in fiscal year 1954, which is the end of the production effort coming out of the 1953 budget, are to discontinue lines. Where, for example, we have three lines going—I remember that among some of the electronic items—they will go down to two or maybe to even one.

(Off the record.)

DISPOSITION OF SAVINGS DUE TO REDUCED UNIT COSTS

Mr. SIKES. A comparison study made by this committee of the unit costs in the 1952 budget and the unit costs for the same items in the 1953 budget indicates that the present unit costs are less. For example, on 14 Ordnance items a saving of $562 million is indicated. What was done with these savings?

General REEDER. I should like to get that question straight—that the prices are less? That can be deceptive. The prices in the 1953 budget will very often be for items of war reserve and the price of an item for war reserve should differ from that of initial equipment by the cost of the concurrent spare parts. When we are putting an item into service and buying the concurrent spares, we buy only enough to support the population of the equipment in use. Thus, when a tank is shot up and a new tank issued in its place from the reserve, we do not have to have any additional concurrent spares. Those are already in the system. That accounts for a large part of that.

DETERMINATION OF REQUIREMENTS TO BE BUDGETED

Mr. SIKES. Since in the majority of cases you do not request in 1953 sufficient funds to cover your gross requirements, how did you determine how much was needed in 1953?

General REEDER. We determined it by the process which I decribed this morning in my opening statement, the 519's which give the gross requirement, the amount which we thought we should budget to be ready for war as of a certain date; and then we have reduced that, postponing the date somewhat by endeavoring to bring each programed item down in step with the other.

Mr. SIKES. Why do you request funds to build up the mobilization reserve on some items when there are other items for which active Army requirements will not be filled by the end of 1953?

General REEDER. That is purely a matter of balance.

Mr. SIKES. Is there a balance there? We feel that there is not a balance there, since there is not generally the same proportion being maintained between different items in your total requirements. On some items you are building up your mobilization reserve and on some items you are not. It appears that there is not a balance between items? Why is that?

General REEDER. I believe, sir, that that is more apparent than real. We have endeavored to maintain that balance in the case of some of the longer lead time——

Mr. SIKES. Does lead time enter into it?

General REEDER. Yes, sir; in two ways. First all, we should have a larger proportion of the reserve in case of the long lead time items.

Mr. SIKES. What other rules do you follow in deciding which items to build up, the larger percentage of items in mobilization reserve?

General REEDER. The lead time and the difficulty of procurement, the importance to the combat soldier, are the essential things. We temper the requirements when, because of the difficulty of getting production started, there is no use buying more than a certain amount because it will not be delivered within the time that the appropriation will cover. So there is a reasonable minimum order, enough to get started and run through the first year which we would then budget for.

Mr. SIKES. So that you do not attempt to have one specific percentage of mobilization reserve on hand at any given period?

General REEDER. No, sir. It will vary with the item. That actually I think is one of the main excuses for people like me, to use some judgment in differentiating between items, because we cannot put this voluminous work out to clerks and get answers that make sense.

LAPSE IN DELIVERY SCHEDULES

Mr. SIKES. At the request of the committee, you have supplied delivery schedules on 34 items and these delivery schedules indicate a lapse in deliveries, or deliveries under minimum production capacity for periods of a quarter or more. For example: under Engineers, semi-trailer, low bed, minimum production 270 per quarter; deliveries, for the quarter ending December 1952, 167; for the quarter ending March 1953, 0; for the quarter ending June 1953, 204; for the quarter ending September 1953, 0.

Building, prefabricated, minimum production not given, Navy purchase: Deliveries—for the quarter ending December 1952, 4,957; for the quarter ending March 1953, 0; for the quarter ending June 1953, 3,000.

As to those with which you are familiar, does that mean that these factories shut down and then start up again?

General REEDER. No, sir. Those are items sufficiently commercial that we do not consider it necessary to maintain a production line. In other words, the purpose of our orders in both those instances, is to get a specific number of units.

Mr. SIKES. Since you are probably the biggest customer of those producers, does it not disrupt the orderly flow of their operations and therefore affect the economy, to have fluctuating deliveries, like those?

General REEDER. No, sir. In the first case, the low-bed trailer, that is nothing in the world but the thing that gets in your way when you are trying to get down here to work. Somebody is moving a steamshovel or a bulldozer. It is virtually a commercial job. So that when the company gets an order from us, we can give them the schedule, but they do not pay too much attention to it. If it suits their business to run it off fast, they will run it off and deliver it to us when they are ready, and turn to another job.

Mr. SIKES. Are you sure these are commercial items. You do not have specifications——

General REEDER. We have specifications, but they differ so little from the commercial that there is very little difference. We may want a front-loading job whereas they use a slightly different kind of unit.

Mr. SIKES. I understand the manufacturers do not feel that way about it. They feel it is very difficult to live up to your specifications; that they are entirely different from the commercial operation.

General REEDER. I do not think we have had any great difficulty with that.

Mr. SIKES. Do you not feel that you could provide for a more even flow of deliveries and thereby provide a helpful influence on industry generally without interfering with your own operation?

General REEDER. We would prefer it.

Mr. SIKES. Why do you not do so?

General REEDER. Well, sometimes we just gum it up.

Mr. SIKES. Is that S.O.P. or is that going to modified and changed?

General REEDER. It is a standard policy not to gum things up, but it is a historical fact that it continues to happen and breaks out somewhere else when we cure it. As to the prefabs, until very recently,

those were just plain Quonset huts which were not in production line business. A lot of them we have gotten from the Navy stock, and they were then reprocured. They procured those. We did not.

DEFINITION OF "MINIMUM AND MAXIMUM PRODUCTION CAPACITY"

Mr. SIKES. I want to be sure I understand your definition of "minimum and maximum production capacity." Why do you not tell me how you compute minimum and maximum production capacity?

General REEDER. Well, we define it and we leave it to the Technical Services to give us what they calculate it to be. But we do it on the basis of one reasonably full shift.

Mr. SIKES. One reasonably full shift is what?

General REEDER. Let me illustrate.

Mr. SIKES. Is that minimum capacity?

General REEDER. Yes, sir.

Mr. SIKES. One reasonably full shift?

General REEDER. Yes, sir. You see, with one shift and a little overtime work you can get considerably more production than with a straight single shift. No production line as laid out is perfect. There is a bottleneck at one tool or one operation, and by operating that tool a few extra hours you can get a lot more out of one shift.

Mr. SIKES. When you say one reasonably full shift, do you mean all the facilities that are in production—all the factories?

General REEDER. That would be right, sir.

Mr. SIKES. What would maximum capacity be? Three full shifts?

General REEDER. Two and one-half or three, whichever is more efficient. Usually where you are using much in the way of equipment two 10-hour shifts gives you as good or better results, because you then have some hours left over for your maintenance men to get in on the machinery.

Mr. SIKES. Could minimum capacity be called the lowest level at which the production lines are kept hot?

General REEDER. No, sir. Not those that show on these schedules.

Mr. SIKES. Why not?

General REEDER. We can and will go below that. I would like to get your interpretation.

General FORD. Mr. Chairman, it is a matter that we have to consider as to what kind of a product we are talking about, I believe. Take the chemical industry, which we are very much concerned with. The chemical industry, by and large, is an around-the-clock operation. I mean, the chemical plant is that kind of a process. We have another operation in our ammunition field which has to be around the clock. That is in loading high explosives into a projectile where we melt the high explosives. It takes heat to melt up the metals and all the equipment and we will, therefore, pour that high explosive probably around the clock. It depends so much on what kind of a product we are talking about.

I happened to talk yesterday to a vice president of the Firestone Rubber Co. He says he operates in making his tires four 6-hour shifts. He works right around the clock because he has essentially a type of processing which involves heat. You just cannot turn on and off the spigot and do it economically.

In the case of a machine operation, or where you are cutting metal, obviously you can stop the machines and nothing has to be heated up, so to speak.

What we would like to do in our program—and I do not know whether this has been covered—is to have a capacity whereby we could get our product under the present program essentially on a 40-, 44- or 48-hour week. We would like to have that. Then we think we are in the best possible position for an all-out war in that then we could get into an all-out production and the time element would be that which is determined by being able to get materials and people in and get the people trained, and get the materials in, in order to keep the machines running around the clock.

General REEDER. It is a little hard to answer. You mentioned a blast furnace.

General FORD. Yes. That is where you are using heat again for melting, like in our foundries. When I say "our foundries" I mean industry foundries, where they are pouring steel for our tank hulls and turrets. Those are heated up and they pour steel around the clock. It has to be that way.

There are certain machining operations, on the other hand, on which we would like to have the capacity to do that machining operation on essentially an 8-hour basis.

Mr. SIKES. Yes.

General FORD. In order that we might have this production base and to be in a good position to go into an all-out production. It is complicated. Almost every item or every operation, or every component making up every item, has to be judged pretty much by itself.

DEFINITION OF LEAD TIME

Mr. SIKES. As I understand lead time it is the time lag between the time when it is determined to buy an item and the time when the first deliveries are received. Is that true?

General REEDER. Yes, sir.

Mr. SIKES. Then it is assumed that an even flow of production is desirable. In that case your 1953 requests should cover deliveries into the fiscal year 1954 equal to the lead time?

General REEDER. That is right, sir.

Mr. SIKES. And that is not the case on the items on which we have detailed information. How does the Army expect to keep the necessary production lines going if there are to be lapses in production?

General REEDER. I do not think that we are going to have lapses. We are depending in part upon the MDAP programs and the other services who buy through our Procurement.

Mr. SIKES. Has all of that been correlated with your own production requirements so that their requirements fill in the gaps, so to speak?

General REEDER. Yes, sir. We are engaged in doing that, and I would like just to say this off the record.

(Discussion off the record.)

ACCURACY OF TRANSPORTATION CORPS ESTIMATES

Mr. SIKES. The Transportation Corps anticipates delivery by December 1952 of 17 Diesel locomotives, to be budgeted from 1953 funds. 1953 funds presumably will be available the first of July. If you

have a 9-month lead time on an item you expect to get in 6 months, how do you do it?

General REEDER. What is that again?

Mr. SIKES. You have 17 Diesel locomotives out of 1953 funds which would become available the first of July. They are expected to be delivered in 6 months, actually in December 1952, but you have a 9-month lead time. How do you do it?

General REEDER. We cannot.

Mr. SIKES. Did someone slip up there?

General REEDER. No. They will not be produced.

Mr. SIKES. Let us get into that a little bit more. How frequently do your people slip up on these figures. How much dependence can we place on them?

General REEDER. I think that we can place just about as much dependence on them as you could reasonably expect, sir. That has gotten by, and possibly it got by our reviewers, who should catch it. But I find that when I have gone over all these 519's—which I do personally, and I go over all the production stuff, and I do have to do it rather rapidly—I find that I make mistakes. I miss some things which when I look at them again become apparent. Yes, we make mistakes, but I think that as far as scheduling is concerned we have steadily improved, and our forecasts and our whole operation is so much closer to reality and so much in the hands of better trained men and more experienced people today that it was 6 months or a year ago, that I am rather proud of what has been accomplished. I am not ashamed to admit a mistake or to.

Mr. SIKES. General, I want to thank you for an honest answer. I much prefer that we understand each other thoroughly and we have the feeling you are doing the best you can in a tough job, but you, like everybody else, can make mistakes. When I say "you" of course I mean the Army.

General REEDER. Well, I have assistance in making mistakes as well.

COMPARISON OF DELIVERY SCHEDULE WITH ACTUAL DELIVERIES

Mr. SIKES. In comparison with your July delivery schedule on the 34 items submitted to the committee, the actual deliveries for the period July–December 1951 indicates a slippage variance from zero to 98 percent. On the question of 90 millimeter tanks on delivery December 31, 1951, you had 11 percent slippage; 5-ton trucks, 50 percent slippage; armored infantry vehicles, 98 percent slippage; cable assemblies, 80 percent slippage. Generally your present schedule indicates a considerable improvement by the end of 1953.

What assurance can be given this committee that those improvements actually will occur?

General REEDER. I think the best assurance of that is that they are perfectly normal to occur. The early schedules which we made were based upon a greater sense of urgency than the country as a whole now displays. They were therefore more optimistic. They should have been optimistic because we were shooting at targets and setting our sights rather than being certain that we would achieve those goals. It is implicit in any industrial mobilization that it takes you about a year and a half to get under way, and some of the things do as well as ex-

pected, and some do worse. It is mostly worse because it is in the essence of the thing that you try to do well and you start out with the assumption that you are going to do well.

We are just about the break of the curve where the items that were started out a year and a half ago, or a little more than that, have gotten through their growing pains and are coming along.

Mr. SIKES. Do you think there is a possibility, and a good possibility, that if your schedule is still higher that slippages will be more than you are now anticipating?

General REEDER. Yes, sir; there will be. I would like to go off the record for a moment, if I might.

Mr. SIKES. All right.

(Discussion off the record.)

POSSIBILITY OF REDUCTION IN PROCUREMENT AND PRODUCTION ESTIMATES

Mr. SIKES. Assuming that you may not be able to produce as rapidly as you anticipate in fiscal 1953, does it not follow that we could safely reduce your estimates because you will not be able to produce as much as you are asking money for?

General REEDER. No, sir, because the slippage where it occurs will not extend to the end of 1953, and will have been made up before that; and the amount that we are requesting here is based upon a need for the matériel in order to be reasonably ready for eventualities.

Mr. SIKES. Then you have some carry-over from 1952 on undelivered items.

General REEDER. We have counted all of the carry-over as an asset and programed the entire thing as one piece. In other words, this procurement program because of its magnitude and the lead time of the items involved does not lend itself to single fiscal-year treatment. You have got to take the over-all requirement and the over-all resources with which to meet it and program it over a period of years. Right now our programing is extending to the last quarter of 1954 for the shorter term items, such as ammunition, and well up into 1955 for some long lead time items such as the Skysweeper, or complex radio equipment, radar, and so on.

FUNDS FOR PRODUCTION FACILITY EXPANSION

Mr. SIKES. Tell me something about this $400,000,000 item for production facility expansion. Do I understand that you have that much unobligated carried over from fiscal 1952 into fiscal 1953?

General REEDER. No, sir. We do not expect to carry it over. We agreed as a measure to reduce the fiscal effect of our requirements, to reprograming $400,000,000 of funds originally intended for expediting production into end-item procurement.

Mr. SIKES. You will not use it for expanding production facilities?

General REEDER. That is correct.

Mr. SIKES. You will use it to buy materials?

General REEDER. That is correct and, in fact, it is an amount not asked for here.

Mr. SIKES. How much money are you asking for in this budget to expand production facilities?

General REEDER. Nothing, sir.

Mr. SIKES. No money?

General REEDER. No, sir.

Mr. SIKES. You obligated $600,000,000 in 1951. Do I understand you expect to obligate $1,100,000,000 in 1952?

General REEDER. I do not believe it will be all obligated in the fullest technical sense. It is in the nature of the work that when you go into a project you have first to allocate the funds according to the estimate of the requirement, and you have to have them in order to make such an allocation.

Mr. SIKES. How much will you obligate during fiscal 1952?

General REEDER. I believe that in terms of letter orders, or others, that will be completely obligated or committed.

PRODUCTION BASE

Mr. SIKES. What do you feel has actually been accomplished in the way of a production base by funds of a sizable amount that have been appropriated for production facilities?

General REEDER. I am going to ask when I finish that General Ford add to what I said, because it has been peculiarly expended in his behalf. I think 90 percent or more of them are spent on the Ordnance expansion, because theirs is war-like equipment.

The cost of the tooling is greater. The need for it is far greater, and most of it has gone into that. We have created a base by our expenditures thus far, but we have not yet completed even that which we have already allocated. Nor have we carried out the plans which we started out with. For example, I think I told the committee a year ago, or when we last appeared—we keep coming up here all the time—that we had planned to tool Budd and Brown and Root to make tanks. We have taken no steps in that direction. There was no particular object in rushing out and increasing the demand for machine tools when more proximate needs could not be met. So a great deal of our work remains to be done. We are proceeding with it and we hope in an orderly manner, and trying to get a dollar's worth of work for the dollar that you appropriated.

We have a case right now, and I think General Ford would be glad to go into this still further, on the M–48 tank. What kind of a tank are we going to make? If we are going to make the kind originally planned it is going to take an awful lot of money to set up foundry capacity. The like does not exist in commercial life.

Mr. SIKES. General Ford.

General FORD. That is correct, Mr. Chairman. It is a little difficult to say just how much percentagewise we may have this desired production base. We have it in certain areas. For instance, in the loading of our ammunition we have it, or we have it planned in the rehabilitation of plants and by getting those plants activated and in production. That is with the exception that again there are certain items that are coming in from Research and Development which will call for new types of powders, and new types of explosives, which will call for additional expenditure in getting plants rehabilitated, and so forth.

I could like to give another example, if I may. In some of our rather complicated production, such as in the field of tanks, we have

programmed essentially an adequate production base, but the prime contractors—and I think Cadillac may be taken as a good example—they have in the production of their tanks so far been going through the work and all the engineering of getting into production. They have put in the equipment to give us that production to meet our present schedule. They have not gone out to procure additional equipment to give us a broader production base, because their equipment to some extent is in a not exactly state of flux, but I mean they are making improvements all the time in their manufacturing techniques.

They may find an operation today is taking two or three machines, but by better engineering and better tooling they can do that operation with one machine; or they may want an entirely different type of machine. So before going out and getting additional machines to broaden that base, we are operating from the present machines essentially around the clock.

So that is just a normal development on improving the technique and engineering of getting some of these items into production.

AMOUNT OF FUNDS OBLIGATED FOR EXPEDITING PRODUCTION

Mr. SIKES. How much of this money has been obligated at this time?

General DECKER. In expediting production?

Mr. SIKES. Yes.

General DECKER. Of the 1951 and 1952 funds $813,000,000, approximately, has been obligated.

Mr. SIKES. That is about half of it. Do you really need the remainder?

General REEDER. Yes, sir. Without question. As I said, there are three steps in this business. First of all is the allocation. That precedes quite a little the complete obligation. The man who has the job to do says, "I have to have thus and so." We have gone, where there is any brick and mortar work, to having the engineers even make the estimate or supervise its making to get it accurate. When that comes in and is thoroughly justified we approve the allocation of that amount of money to the project and the comptroller then allots the money. In other words, the man who gets it has a considerable project to accomplish, and he begins to obligate it. But the obligation proceeds only as a program. What he needs first he gets first. He may not order some of the later stuff for some time. In the expenditure, in particular because of the low rate of delivery of machine tools, the funds move slowly. We are not turning the funds into the tools and the capacity nearly as fast as we would like to. We might have allocated for Birdsboro—that is where you are making that tank?

General CUMMINGS. The tank hull. Columbia Steel on the West Coast.

General REEDER. The money for Birdsboro has been allocated for that job for heavens knows how long. Then we had months of trying to allocate the work on the steel cartridge case. The money we knew we had to have for that has been allocated, but we had troubles there again in getting that plant worked out.

PLANNED LEVEL OF PRODUCTION

Mr. SIKES. How have you determined the kind of facilities and level of production which you feel must be available from these funds?

General REEDER. The level of production is determined by our planned maximum capacity. For example, I think Chrysler is to come up to 800 tanks monthly, or somewhere in the neighborhood of that. The casting capacity in back of him has to meet that in turning out the hull and turret. Then the company concerned makes its estimate, which the Ordnance checks.

Mr. SIKES. Can you give me any example? What are the criteria in one, two, three order?

General REEDER. You go ahead, General, on what you do with the company before we get it.

General FORD. Mr. Sikes wanted to get the criteria.

Mr. SIKES. Yes. Not an individual company, but the criteria which you follow in determining the kind of facilities and level of production.

General REEDER. All right, sir. We have a number of very simple rules. We have always in the past followed this. We would not build any plants if we could possibly avoid it. We will reluctantly make brick and mortar additions to commercial plants. We will not create a facility if we can possibly find available a counterpart which will do the job in commercial life.

So the first thing in this whole business is to find a Government-owned plant which is idle or can be converted, and which can be used by contractor operation to do the job.

VULNERABILITY TO ATTACK OF PRODUCTION AREAS

Mr. SIKES. There is a statement that we are developing an American Ruhr, that is, a highly specialized industrial area to a considerable extent augmented and expedited by Government funds, which will make a most attractive enemy target. Do you take into consideration the vulnerability of the areas in which you authorize new plants, or do you simply go in and build close to the biggest plants you can find because you feel they are in best position to expand production?

General REEDER. We would like to take into consideration vulnerability as much as possible. However, we have perhaps wrongly been more concerned with economy—and I say that with a blush—than we should have been. We have not built plants. We have sought out Government plants that could be used. We got the plant there in Cleveland where they are making the light tank. It did not belong to us. It was an Air Force plant.

General FORD. A bomber plant.

General REEDER. It was an air plant. We did some horse trading and got that plant rather than build one. We did not build the Chrysler one either. He built it himself. He got outside the Ruhr. He went down here to Newark, Del., and I think he had good reasons of his own for going there. However, the fact remains there was dispersion in that. We are going to make shells in Riverbank, Calif. Is that right?

General CUMMINGS. Cases, rather.

General REEDER. Yes, cases. We are going to make some more in Burlington, N. J.

Mr. SIKES. Your answer is essentially, "No." You have not regarded the factor of distribution to avoid making them attractive enemy targets.

General REEDER. But the odd part of it is in seeking economy we have achieved about as much dispersion as we might have gotten, sir.

General FORD. We have it well dispersed, Mr. Chairman, as you, I am sure, know, because we have our ammunition loading plants and explosive and chemical plants pretty widely scattered throughout the United States. If we do come up with new construction which must be built, then there is a site board that functions in the General Staff. They take all things into consideration—the location from the standpoint of vulnerability, and the amount of water power, and also possibly whether there is a piece of real estate there already owned by the Government.

NECESSITY FOR EXPANDING PRODUCTION

Mr. SIKES. You have just told me that you have only obligated about half of the money available. You have also told us procurement is now spread out over a greater number of years than you originally planned. Are you certain that all of the money that has been appropriated for expanding production is essential?

General REEDER. I am, sir. Of the unallocated funds——

Mr. SIKES. For the specific purpose of expediting production, or do you expect to use some of it for other purposes?

General REEDER. The $400,000,000 which I mentioned, we expect to use for end item production because the requirement is more promixate or near to us, and because we were frankly trying to reduce this budget by as much as possible.

Mr. SIKES. How does the $4,000,000,000 figure in connection with the $600,000,000 and the $1,100,000,000 that have been appropriated for expanding production in fiscal 1951 and fiscal 1952?

General REEDER. Well, it leaves the balance actually to be devoted to expediting production at $1,700,000,000 for the 2 years. The total appropriation in 1951 of all the supplementals was $1,100,000,000, and in 1952 was $1,000,000,000.

Mr. SIKES. Mr. Flood.

Mr. FLOOD. Off the record.

(Discussion off the record.)

Mr. SCRIVNER. I am glad, General, that Mr. Sikes went into this $400,000,000 that is going to be added to the procurement budget because I was going into it, for I think it is a lot of almost dishonest presentation. As a matter of fact, General, you and all the Departments, including all of the Secretaries and all of the top generals, and everybody else, have known all the way through that under the pressure of the precipitous action in Korea this committee and the Congress were sold—and I mean we were sold clear up to the hilt on the necessity for the appropriation of billions of dollars to get production going and get these lines going. I have forgotten what it was in 1951.

General REEDER. The total for the whole thing was $1,100,000,000 for the Army.

Mr. SCRIVNER. Of course, the Army share of it is only a portion. The Navy had some of it, and Air Force had a chunk of it. My recollection is that this production figure ran pretty close to $5,500,000,000. Is that right?

General REEDER. Yes. The Air did run much higher.

Mr. SRIVNER. Here is the situation where you sold us—and I say "you" advisedly because——

General REEDER. I did personally.

Mr. SCRIVNER. Because we depended upon you many times when we have asked you questions which might be embarrassing, and you told us the truth. Now we find that despite all of that, even though we depended upon your say-so and we told the House of Representatives that we absolutely had to have $1,100,000,000 to get these production lines laid down, now we find that we did not need that much at all, and here is nearly half of it, or $400,000,000, as you tell us right here on page 6, that is now going into end items. Now, frankly, General, that puts us in a very embarrassing position. Either you needed it and you have not used it, or have not been able to use it, or you did not need it. We believed you did, but now come in and say, "No, here we are and we are going to cut down our request for end items to $3,685,000,000." That looks good, and we get a rosy picture, but here comes somebody else who says, "Oh, yes, but we have a little kitty back here of $400,000,000 that we are going to dip into and get end items with $400,,000,000 which we told you a year ago was going to go into production."

General REEDER. We are admitting it right now.

Mr. SCRIVNER. Here is the point I am getting at. When you finished your statement I made a remark which sounded a little facetious, but actually I meant it. I did not know whether, or I doubted that you had ever acted as a defense counsel in a trial, but if you had not you certainly did a good job in this presentation.

General REEDER. As a matter of fact, I have acted as defense counsel.

Mr. SCRIVNER. Then the experience you had stood you in good stead in this very statement you make here. You are on the defensive nearly all the way through, and you should be. Right in this one thing particularly. It is one of the things that makes me wonder whether we waste our time sitting here. It makes me wonder how we can very well hold up our reputation for integrity with the Members of the House when we have told them emphatically last year what the need was to get these lines and these factories set up, and these lines of tools set up, so that we could have our production. We told them we had to have $1,100,000,000 which is a terrific number of $25 war bonds, and they believed us.

General REEDER. They should have.

Mr. SCRIVNER. But now we have to go in and say, "Well, we told you that last year, but the Defense Department is not going to use all that. We told you they were going to spend $1,100,000,000 to get these production lines going, but they are not going to spend that much. They are going to spend only $700,000,000, but they are not going to give you back the rest. The taxpayer has not saved anything. They are not going to give it back, but they will add it now to the production of end items."

General REEDER. All right, sir. I am very glad to answer that because your charge is very proper and I think the answer is due you, and I think it is one of which we do not have to be ashamed.

There is just one thing that I think should be corrected. The total was $2,100,000,000, so that the $400,000,000——

Mr. SCRIVNER. Where did the $1,100,000,000 go?

General REEDER. There was $1,100,000,000 in 1951 and another $1,000,000,000 in 1952.

Mr. SCRIVNER. I think I suggested 2.1 when I started out, and somebody corrected me and said 1.1.

General REEDER. We got that during 1951.

Mr. SCRIVNER. We will accept that figure of $2,100,000,000, but where is the $400,000,000? Is that out of the total of $2,100,000,000?

General REEDER. That is right.

Mr. SCRIVNER. It is $2,100,000,000.

General REEDER. Now that requirement which we stated remains in terms of what we were originally told to set out to do. You remember we were to create a capacity to produce 30,000 tanks a year, medium tanks, or maybe all tanks. We have not done that. Nor could we have sensibly obligated all of that money without putting off its expenditure for quite a long time. We have not, as I said——

FINANCIAL POLICY FORMULATION

Mr. SCRIVNER. In other words then, this is another instance where your office and you particularly in that office were given a goal by somebody else. In other words, somebody told you that we have to meet a certain goal.

General REEDER. That is right.

Mr. SCRIVNER. Did you ever question whether that was a reasonable or possible goal, or are you bound—are you bound in your presentation of these things only to accept the figures that have been given to you from some other source?

General REEDER. Well, it is my job to try the best I can to meet such a goal.

Mr. SCRIVNER. All right. Now that is one of the particular reasons why I was asking you just exactly the questions which I am asking you. If somebody in higher authority—and I do not know—told you that, I want you to tell me that.

In this original presentation under the first impact of Korea certain goals were set and you came up and told us the Army had to have so many billions of dollars to reach certain goals. I am confining it now to this particular one. You told us you had to have $1,100,000,000 in this fiscal year 1951 and you had to have $1,000,000,000 in 1952 to meet this goal. Now we are talking about 1953 funds and you say that the 1951 and 1952 goals were wrong. You did not need it and you could not properly use it. I will say parenthetically that if it could not properly be used, while somebody may have been subject to some blame for giving us a high figure at first, somebody is entitled to some credit for not going ahead and slapping it into something that would not have been a wise expenditure. So that while there is some criticism of somebody, there is also some credit coming back for not having used the $400,000,000, even though it had been appropriated.

But now, who immediately above you gave you the goal which called for the $2,100,000,000, which is not now to be used? In other words, what I am trying to do is to find out what this machinery is and perhaps maybe find out where there might be some changes made.

General REEDER. I would like momentarily to go off the record.

Mr. SCRIVNER. I understand I am putting you, General, in a rather embarrassing position, which I would not intentionally do, but I have no other choice.

General REEDER. It could be done either of two ways. We could take it for the record and then edit it.

Mr. SCRIVNER. That is better. Let us take it for the record because I want to know, and the committee wants to know. Then if anything needs to be, it can be deleted from the record.

General REEDER. All right. The mechanism by which we set out upon this whole business of mobilization derives from the National Security Council, which considers the estimate made by the Central Intelligence Agency of the possibility of war, and then the recommendation to the Joint Chiefs of Staff to meet that policy and finally it sends to the President its recommendations.

Mr. SCRIVNER. Then having gone through that procedure, that finally comes to you?

General REEDER. It comes back down.

Mr. SCRIVNER. And you along with the Congress must then consider the dollars?

General REEDER. Yes.

Mr. SCRIVNER. All right.

General REEDER. The original industrial mobilization directive, you might say, or the date of real danger was set so close to the time that we were submitting the estimates that only superhuman effort and a real war status—even though no war was declared—could have begun to meet the goals. I think many of us recognized that, but the goals had been set and we did ask for what it took to do it. The bill startled everyone.

Mr. SCRIVNER. I will say it did.

General REEDER. And we revised that down, but still went at the effort of coming sensibly close to it.

Mr. SCRIVNER. But now when we come into these hearings we find that the imminence of the danger as then expressed was erroneous, for which we are all duly thankful, and should be, and we find that there now has been a recomputation and reevaluation, and that date having passed we look at a date still further in the future. Is that about it?

General REEDER. That is right.

Mr. SCRIVNER. So that we can now revalue and reconsider some of the decisions that were made.

General REEDER. I think, sir, if I might liken it to Ulysses, who I believe had to get between Scylla and Charybdis, and in order to do that when he got too close to one he started veering off toward the other. I believe the original directive——

Mr. SCRIVNER. But if I remember that correctly, one of the ways that he could have charted his course straight between them was to have filled his ears with wax and listened to neither.

General REEDER. That is what he did.

Mr. SCRIVNER. Possibly then maybe either you or I, or somebody else, should have plugged our ears and not listened to some of the siren songs that we did listen to, because you certainly sang a siren song that netted quite a few hundreds of millions of dollars here.

General REEDER. If that were the thing that we must shoot for—right now in getting away from the Scylla of aggression they came a little too close to the Charybdis of economic collapse.

Mr. FLOOD. I just want to ask him one question. There is no doubt in my mind from what you say that you are now engaged in a complete rescheduling of your lead dates as against delivery dates of items.

General REEDER. In a rescheduling of production.

Mr. FLOOD. Surely. If you are engaged in all of that now, why in the world do you not take this budget back and predicate it upon such rescheduling in view of all you have just said and bring us back a budget reflecting that whole operation? Why do you want to do it right in the middle of this thing? In other words, this is for 1953.

General REEDER. That is right.

Mr. FLOOD. The 1953 budget before us now on which we are sitting here with the Army holding hearings, and for which you are the budget officer, is not a true reflection of what you have in your minds this minute, because of your rescheduling. Is that not so?

General REEDER. No, sir.

Mr. FLOOD. Why not?

General REEDER. Because this budet reflects the minimum requirements and our job in rescheduling is to try and use as small a procurement as this represents and still maintain production. That is the problem.

Mr. FLOOD. On these time lags between the lead date and delivery date for an item, you say there is no lag in there?

General REEDER. There is nothing there—

Mr. FLOOD. Six months is half of a fiscal year.

General REEDER. That is right, but that has not entered into it.

Mr. FLOOD. Who is filling the hole? Who is going to do the procuring? Who is going to fill up these holes when your plants are shut down according to your existing rescheduling as of the end of the fiscal period of 1952? Before you finish the fiscal year 1952, on the calendar then you are 3 months at least into your scheduling and programing and budgeting and estimations for this budget you brought up to us in the last 30 days. Is that not correct? Approximately. You were working on this present budget certainly 3 months before the terminal date of the 1952 fiscal period. You had to go downtown first.

General REEDER. Wait a minute. We are in fiscal year 1952.

Mr. FLOOD. Nobody knows that better than I do, but we are talking about 1953.

General REEDER. Right.

Mr. FLOOD. When did you first go downtown with this budget to the Bureau of the Budget?

General DECKER. In December.

Mr. FLOOD. Surely. How long were you working on it before you took it downtown? Six months? I do not mean a continual operation that always goes on, but the whole job when it was taken downtown.

General DECKER. We got our directive from the Office of the Secretary of Defense on the 29th of October.

Mr. FLOOD. Then you took it downtown and brought it up here. What did you ask them downtown for?

General DECKER. We were directed to submit it to the Secretary of Defense by the 20th of November.

General REEDER. For $8.6 billion.

Mr. FLOOD. You asked Budget for $8.6?

General REEDER. Yes.

Mr. FLOOD. What did they give you?

General REEDER. $3.865.

Mr. FLOOD. If everything you have told us here is so, why would you ask Budget for that kind of a figure, in view of what they just read you from your own statement here? Why under the sun, General, would you ask for $8.6 from the people downtown at Budget, in view of this language in your own statement? Why would you ask for that much?

General REEDER. Why not?

Mr. FLOOD. Especially with this rescheduling going on?

General REEDER. Now wait a minute. You got confused. Rescheduling because of a reduced budget.

Mr. FLOOD. Oh, you knew that was going to happen. Do not tell me you walked out of the Budget office shocked and amazed.

General REEDER. I usually do.

Mr. FLOOD. Oh, no. You might walk out of here that way, but not down there. You came within a good hop, skip, and a jump, unless somebody lost their reason down there, as to about what you would get over-all. Not item by item. You did better in some and they were unreasonable in others, but you came out of there in the general areas of where you thought you would be. You have a pretty good guess as to about where you think you will come out of here. But this morning——

General REEDER. I think you have confused certain things, sir.

Mr. FLOOD. I do not doubt that.

General REEDER. Let us get back to bed rock here.

Mr. FLOOD. I am talking about two things at the same time. There is no doubt about that.

General REEDER. You are mixing them.

Mr. FLOOD. But how are they mixed? I am talking about estimates and the rescheduling.

General REEDER. That is right.

Mr. FLOOD. They are certainly identified together. You cannot separate them.

General REEDER. That is right, and when you reduce the estimates you have to change the scheduling to match.

Mr. FLOOD. I am sorry. That is the rule book.

General REEDER. That is the fact.

Mr. FLOOD. Why did not this estimate when it came to us reflect more completely and more fairly your plans? I have a very high regard for you, in doing this kind of thing. I think you know what you are doing. You are under orders. You do have only two stars on. I know that. You can only go so far, too.

General REEDER. You will be surprised how much I can say.

Mr. FLOOD. I know the budget men weigh a little more even without the brass than somebody else does, but at the same time I am by no means convinced—and this is no reflection on you because I know you get a quota and you have to meet it—but how far you can object I do not know. That is a matter of personalities. When they change their mind, though, do they tell you? You do not find it out, do you?

General REEDER. Yes. I was up at the wake with Mr. Wilson and Mr. Lawton, when they all came over to tell Defense that they could not get ready on the date which they had based the budget on.

Mr. FLOOD. That who could not get ready?

General REEDER. Defense. That we could not be ready for war on that date.

Mr. SCRIVNER. Not only Defense, but industry and the Nation as a whole.

General REEDER. Yes. That is right. It was a national business.

Mr. FLOOD. But what time of the fiscal year was that as far as you were concerned?

General REEDER. That was about the middle of December, was it not?

Mr. FLOOD. You were working on this in October?

General REEDER. That is right, sir.

Mr. FLOOD. What effort did you make before we got this document to be ready to reflect all of those experiences by the time you walked into this room?

General REEDER. Those sad experiences are reflected in the 3.685 figure.

Mr. FLOOD. That is downtown. You mean they cut you to the difference between what you asked and what you got?

General REEDER. That is right. We asked 8.6.

Mr. FLOOD. What do you think should be our procedure on what you bring in here?

General REEDER. I do not know, sir. I think you would be best advised to examine it searchingly and see whether we really need this money which we honestly believe we do.

Mr. FLOOD. I think this committee is very much on your side, but you make it so difficult for us to be for you. I have never in my experience up here has so much trouble trying to help people and trying to be for anybody as I have since I sat on this subcommittee. I have never had so many people get in my way. I insist I have been one of your best witnesses. With the exception of one or two people the Army is not helping me.

That is your business. Maybe you are so surprised you have friends up here that you do not recognize one, but that is all right too.

General REEDER. I am trying to answer your questions the best I can.

Mr. SCRIVNER. Mr. Flood, I might make this observation. They do not need too much help. They do pretty well.

Mr. FLOOD. In a sense that is true.

Mr. SCRIVNER. Let me make one point. I have just heard all the sobs and have seen the blood and the gore from being cut from $8,000,000,000 to $3,685,000,000.

Mr. FLOOD. Yes.

Mr. SCRIVNER. But they did not let themselves be hurt quite that badly because all they had to do is just turn right around immediately and grab off $400,000,000 which was a pretty sizable amount, and add it to this figure. It was about a half a billion dollars of money that accordingly was cut off for this particular program.

Mr. FLOOD. General, do you think that is all right? I want your professional opinion. If I meet you later on and we have a conversation, that might be different, but as the chief of this outfit and working under the superiors that you have, do you think—and this will not hurt your record—do you think doing what you did is proper? This astounds me. You even print this here.

Do you think this is proper to do this? I admire you for having typed it out here. So many of the administrative agencies do not do that. But at least you have done it, which indicates that you think this is ethical, moral, legal, desirable and commendable, for the good of the service, and Congress, and everybody else.

General REEDER. All right, sir. That question could come from either of two viewpoints. Let me answer it both ways.

In the first place, I did this somewhat under direction, but we could have done it in either of two ways. One would have been to ask for an appropriation of $4,085,000,000 instead of $3,685,000,000.

Mr. SCRIVNER. Yes, but downtown they told you you could have only $3,685,000,000.

General REEDER. Yes, but part of that is they said, "You will have to reprogram $400,000,000." It could have been done, as I said, in either of two ways. We could have asked for the larger appropriation and suggested simultaneous rescission of $400,000,000. I was not asked which way to do that. I think that might have been more understandable to the Congress.

Mr. FLOOD. You would not have ruffled our tail feathers so badly perhaps. That is a highly advisable sort of thing to avoid sometimes.

General REEDER. I did not make that decision.

Mr. FLOOD. That is the end of that.

Mr. SCRIVNER. I realize General Reeder did not have that decision to make, but nevertheless the results, as far as we are concerned, whoever made the decision, are that it is not the direct approach. It makes a better presentation and better picture to be able to say that, after all, in this program we are only asking Congress to appropriate $3,685,000,000.

Mr. FLOOD. Exactly.

Mr. SCRIVNER. But the rest of it has already been done. So that as far as the taxpayer is concerned he thinks when he hears about this that, lo and behold, the Defense Department has started to save him some money. Actually what has happened is that we appropriated the $400,000,000 last year as part of the $1,000,000,000 and the $1,100,000,000 the year before supposedly to expand our production lines. So as far as the taxpayer is concerned, he is getting a little bit of hocus-pocus there. He thought he was being saved some money, but the $400,000,000 is coming out of another pocket into which his dollars have gone.

Mr. FLOOD. Is this a universally accepted thing? I am not suggesting that this is a conspiracy or something you are doing under the table, and that you are trying to outsmart us. I am sure that is not it. I am afraid that you—and I am using "you" in the plural sense—reflect in this case a feeling that this type of bookkeeping is the kind of appropriation practice accepted as correct between the administrative branch and the legislative. I believe that is the trouble.

General REEDER. Well, sir, I beleive that if we had not felt that it was essential that you know that it was going on, I would not have mentioned it.

Mr. FLOOD. For the purpose of emphasis I repeat, that is commendable.

General REEDER. Let me try to distinguish between a major change of programing such as this is, and to which you are certainly entitled to every bit of information, and probably it would have been better to put it more in the form of a decision. I did not make that decision. However, in the very nature of carrying out a program with appropriated funds, we have to make some adjustments in the programs as you appropriate them. A tank costs more than we had it scheduled for.

Mr. FLOOD. Please avoid tanks as that is our bête noire here. Let us us use some other example. That thing is becoming such a chestnut, General.

General REEDER. It would not make any difference.

Mr. FLOOD. Just for the sake of my digestion, then, will you avoid tanks, if for no other reason?

General REEDER. Well, we will turn to the Quartermaster for a moment. We go out into the market to get cloth. We start with the cloth. You appropriate the money which we asked for on the basis of wool costing a dollar and a half a pound. The wool went up and we bought some cloth as high as $4 a pound, I guess.

Mr. FLOOD. And pepper.

General REEDER. I do not think the price of pepper fluctuated so much. However, we probably lost some money on the cloth and paid more than we expected. When we came to put out bids for converting some of that cloth into uniforms, the competition was so severe that we saved some money. Those things stand one another off.

Mr. FLOOD. That makes some sense.

General REEDER. And that is a normal thing which we expect to do in reprograming without feeling that we have to rush up and offer an explanation about it. But when you have appropriated $2,100,000,000 with a definite purpose in mind and we reprogram that within the appropriation, but to a completely different purpose, you are due at least to be told that that is being done.

Mr. SCRIVNER. Yes; that is one of the things we like to know, but this is the first time I, as a member of this committee, knew that there had ever been any change in your program relating to the $2,100,000,000, and that is just thrown indirectly into this statement here. A half a billion dollar change in a program is not a minor change.

General REEDER. No, sir.

Mr. FLOOD. And if you had gone to answer a telephone call you would not have known what happened in 2 minutes.

Mr. SCRIVNER. Probably not.

Mr. FLOOD. Certainly not.

Mr. SCRIVNER. You can walk out of this room and get a drink of water and a half a billion dollars has been discussed.

Mr. FLOOD. General, I follow you entirely and I have no objection to that. It makes sense and I am sure you do it well, but there is a question of degree, General. You are dealing in boxcar figures in your defense budget. This becomes progressive. Of course, from our point of view it becomes progressively worse. The minute you do that kind of rescheduling, if ever the law of diminishing returns starts working, that is the point at which it starts. This morning I was trying to point out to you——

Mr. SCRIVNER. Mr. Flood, could I ask one question while we are on this subject?

Mr. FLOOD. Yes.

Mr. SCRIVNER. So it will not be lost. It is another point as far as this expediting of production is concerned. What authority, in representing the Department of Defense, do you have to transfer the $400,000,000 from expediting production, the specific item for which it was appropriated, and transfer it into a program of obtaining end items?

General REEDER. That would hark back into title IV of the National Security Act and the performance budget.

Mr. SCRIVNER. Let us do a little more harking back. Let us hark back to title III, where last year's law set up this whole thing under the Department of the Army, and that billion dollars is money earmarked for one purpose, and one purpose only. If it was not used for that the proper thing should be that it should have reverted to the Treasury, because reading on page 73 of our print for the one item, "Expediting production," it was to enable the Secretary of the Army without reference to certain sections of the statute except other provisions—it was for the purpose of expediting the production of equipment and supplies for the Army for emergency national defense purposes. It goes on to say what else it is. The amount is $1,000,000,000. If that is not earmarking, then I never saw it. If we cannot earmark it by language like that in the bill, then Congress has lost complete control over the manner in which money is to be spent. If we have lost complete control there is not much use in our sitting back here and tilting at windmills and getting a lot of detailed information about what the money is going for, if they can take even specifically earmarked funds and transfer them to some other activity.

Mr. FLOOD. You know, General, we have a concept of the budget in Congress. There may be a difference of opinion as to who is running this Government, but we are laboring under the constitutional assumption that we have something to do with making the law. You can get several opinions about that, too, but at least that is what we think.

However, it is not coming out that way. This is the second point Mr. Scrivner was just developing. Do you indicate to me now that providing something else does not give you money on a bookkeeping transaction——

General REEDER. Practically that is the joker to it. It is sort of a bookkeeping transaction.

Mr. FLOOD. Then your procurement schedules will run for 6 months, and if they terminate at the end of 6 months the only thing that keeps

your procurement plans from shutting down is somebody rushing into the breach and manning the barricades with their money to keep your potential operating?

General REEDER. Let me describe it.

Mr. FLOOD. Is that not about what happens? Say at the end of 6½ months you have rescheduled the thing and your production is up. You have a group of plants there. This is a serious economic problem. You do not want to shut them down because you have the whole problem of reopening them again. So what do you do? You get the MDAP or somebody else to rush in there and pick up that slack for you. Is that not so?

General REEDER. Well, yes; in a rough way.

Mr. FLOOD. In a rough way. Without the details and figures and identifying it.

General REEDER. Yes.

Mr. FLOOD. In other words, an analysis of your whole plan of production schedules, if that could be undertaken—and I certainly think somebody should undertake it——

General REEDER. Enough people look at it.

Mr. FLOOD. So much the more. This seems to be another case where you are passing judgment on your own requirements. There is only an occasional check and I do not know what we can substitute for it.

General REEDER. You mean as to your 519's?

Mr. FLOOD. Yes.

General REEDER. Those are examined by the examiners of the Department of Defense, who question them. They are also examined by the Bureau of the Budget, who pick on them.

Mr. FLOOD. That is true of any Department. I am trying to think why special attention should not be given to this program if for no other reason than, first, its intent and, second, its magnitude. I do not think enough consideration and attention has been given to helping you because of the sheer magnitude. I want to make it clear to you—and I think I speak for my friends here—that it is a shame you have to be the whipping boy. Of course, it is your job.

General REEDER. Oh, that is all right.

Mr. FLOOD. There are a lot of people I would like to have here during this budget estimate examination besides you. There are a lot of missing characters on the dramatis personae of this justification who have given you bum steers and changed their minds and not informed you in time, so that you have to come up to us and present to us what I am sure is a budget suffering from badly administered rescheduling, especially in large, well-known procurement areas. I have no doubt about that.

Before I finish I want to return to this analysis of your program reschedules. You know what the great danger, without passing upon the merits of the plan, is going to be in this Schuman plan. They are going to run into the shutting down of high-cost production Belgian mines. I am an enthusiast about the plan, so you know where I stand. Where you stand is none of my business for this purpose. But are you going to run into the same kind of thing on this rescheduling? We must know what is going to happen to this economy.

General REEDER. I am very glad to answer that, sir. Our policy has already begun to crack down on the maintenance of uneconomic production base.

Mr. FLOOD. What you were going to tell me was that you were just beginning to do what?

General REEDER. To thin out what had been a production base. We are coming in this scheduling to a matter of, let us say, three fellows making a radio set—a PRC 6 or 8 or 9 or10. I do not know who they are but they might be RCA and Admiral and another outfit. Suppose we can only keep one of them going. We have only enough business for that one. We have gone far enough along with our requirements to have only one going. We are not going to place that on a preferred basis or negotiation.

Mr. FLOOD. Are you going to put them all in one town? Are you going to put them all in one area? This country is growing, too. We are getting a lot of growing aches and pains that nobody has been noting until the last 30 days, and which in my opinion the Army is not going to pay any attention to anyhow, unless they have changed in the last month.

General REEDER. We expect that as that thins down, to place the job by competition.

Mr. FLOOD. That is not fair to you, is it? You want to have some right of selection on that kind of situation. It strikes me as being very important.

General REEDER. Well, we would if there were good military reasons, but lacking that, let us say that these three producers are equally good and we have nothing to choose between them.

Mr. FLOOD. Yes.

General REEDER. Then we would put the thing out on a competitive bid and try to consider the taxpayers' dollars.

Mr. FLOOD. Off the record.

(Discussion off the record.)

FRIDAY, MARCH 7, 1952.

AUTHORITY FOR USE OF EXPEDITING PRODUCTION FUNDS FOR END ITEMS

Mr. RILEY. Mr. Scrivner——

Mr. SCRIVNER. Mr. Chairman, when we adjourned yesterday, we were discussing the matter of the use of $400 million originally appropriated and earmarked for expediting production, to be used according to recent reports for the procurement of end items. I have asked what authority the Department of Defense had so to transfer those funds. Is there any statement on that available at this time?

General DECKER. Yes, sir; I would like to make a statement on that. The authority for using expediting funds for the procurement of end items is included in the language of the appropriation itself; that is, the expediting production appropriation. If the committee would hear me, I would like to read the language of the appropriation.

To enable the Secretary of the Army, without reference to section 3734 of the Revised Statutes, as amended, and to section 1136 of the Revised Statutes, as amended (except provisions thereof relating to title approval), to expedite the production of equipment and supplies for the Army for emergency national defense purposes, including all of the objects and purposes specified under each of the appropriations available to the Department of the Army during the current fiscal year, for procurement or production of equipment or supplies, for

erection of structures, or for acquisition of land; the furnishing of Government-owned facilities at privately owned plants; the procurement and training of civilian personnel in connection with the production of equipment and material and the use and operation thereof, $1,000,000,000.

That is the basic authority to use it. However, when the Army appeared before this committee last year in defense of this appropriation, we indicated that we were going to use this money for the provision of a production base rather than for the procurement of end items.

Since we did that, the program has been curtailed somewhat and it now appears that all of this money will not be required for the provision of the production base.

Consequently there is available approximately $400 million for reprograming against end items, which was taken into account to reduce either a supplemental budget request or the 1953 request.

This is not something that has already been accomplished. We are telling the committee about it. We would not propose any such thing without the knowledge and approval of the committee.

At the present time this money is in reserve in the Bureau of the Budget and it will require apportionment by the Bureau of the Budget before we can use it for that purpose.

We are not advising the committee that this is something that has been done. We are now advising you of what is proposed.

That is the basic authority and the position we are in with respect to this in our Department.

Mr. SCRIVNER. Even so, my recollection is that during these hearings, when we had the seven-man subcommittee together, the Secretary of Defense was before us and that time would have been the proper time to have discussed funds for expediting production and whether they were going to ask for less or more or make a different use of that money.

I do not recall that it was ever mentioned. Apparently that decision was made since that time. When was the decision made to use the $400 million?

General REEDER. In December.

Mr. SCRIVNER. Then that was prior to the time the Secretary of Defense was before us. It seems more than passing strange that we were not appraised of what was to be done.

Do you have something to add to this, General Moore?

General MOORE. Yes, sir. The Secretary of Defense has indicated clearly to the committee that in connection with the combat consumption in Korea, he would have to request a supplemental estimate this current fiscal year. In connection with that discussion he made it perfectly plain that he would use the assets of the Department of Defense and the funds already appropriated, to the maximum extent possible within legal limits, and would not ask the Congress for a supplemental appropriation if he could finance with funds already available.

A supplemental request is being prepared and will be submitted to the Congress during this session. In connection with the preparation of that supplemental, as well as the 1953 estimates, the Department counted on the utilization of these funds as well as others to finance activities and programs for the remainder of the year. The funds are still held in reserve. Also in connection with the presentation of the

supplemental estimates when they arrive in the Congress from the Bureau of the Budget, an explanation of this proposal will be made again.

Mr. SCRIVNER. Some day we are going to have to have a showndown and see whether Congress has control over funds or not. I had assumed we had when we were earmarking. If we do not, we had better find out.

On the other hand, the Defense Department knows and has known that we were thoroughly sold on the program of making production possible. It was a common-sense program and as nearly as I can recall now, there was no cut made either by the committee or by the Congress in any of the amounts requested for that program. Now it is quite apparent that at least a half billion dollars of overestimate was made. How much more, I do not know.

Who would know how much was left unobligated in this fund, in addition to the $400 million?

General DECKER. To date there has been $813 million obligated against both 1951 and 1952 funds.

Mr. SCRIVNER. That is, $813 million out of——

General DECKER. Two and one-tenth billion.

Mr. SCRIVNER. That is $2,100 million. That would come to a fraction more than one-third. Using the $400 million would bring you up to just a little over $1.2 billion, which would apparently leave us somewhere in the neighborhood of $900 million still in the expediting kitty.

Does that come within your activity—the balance of $900 million?

General REEDER. Yes, sir.

Mr. SCRIVNER. I thought that came under the Department of Defense for all the Services?

General REEDER. No, sir; this is for the Army only.

Mr. SCRIVNER. What is the $900 million to be used for?

General REEDER. Of that amount, of the total $2.1 billion, there has been allocated to projects about $1,275,000,000—I may be a few million dollars off; I cannot remember whether we got $90 million or $75 million out of the budget the last time—and we are seeking another apportionment from the Bureau of the Budget to cover allocations which were in your office for approval. They run about $75 million or so.

There is being considered the best use for the remaining funds. We have the necessity, if we continue with this full one-piece cast of the medium tank, of setting up facilities that would cost between $200 and $300 million—at least.

General CUMMINGS. That would be on the high side, sir.

Mr. SCRIVNER. That would make it a pretty expensive tank.

General REEDER. It is. We have that to consider. We have a Chemical proposal to create capacity which would use about $250 million and it may be somewhere between $300 to $400 million. We have not even got a sound estimate on that. It is big business. Those are the two big items.

NITRIC-ACID PLANT

Mr. SCRIVNER. Many of these matters raise a lot of questions in people's minds. For instance, I just learned through the newspapers—not from any official source whatsoever—that they are going to put up a new nitric-acid plant, when we have a plant at Sunflower,

Kans. They have a nitric-acid production there now that is not being used. This is only what I read in the newspapers; nobody ever told me that they were putting anything out there, which touches the point that Mr. Flood has raised with you gentleman before. It is proposed in this plant to extract nitric acid from the air. It will be a pilot plant.

When the people around there, who are taxpayers and who know that there is a nitric-acid plant already there which is not being used, learn of this, it will make them wonder why Uncle Sam should go in there and spend several million dollars to build another nitric-acid plant at the same place. And I wonder, too.

General REEDER. As far as I know, that item was extracted from the air. Have we any plan of that sort?

General CUMMINGS. I am not familiar with that aspect of it. I will get you the facts, sir.

Mr. SCRIVNER. I was not aware of it until it was printed in the newspapers.

Mr. FLOOD. Nobody told the gentleman anything about it?

Mr. SCRIVNER. Oh, no.

General REEDER. I missed it, too.

Mr. SCRIVNER. I would like to have some information on it because that plant that was there was a good plant and during World War II it produced all the nitric acid, so I am told, necessary to keep it going full blast. It is not nearly up to that capacity now. So you cannot blame these people for wondering.

General CUMMINGS. I shall obtain the facts on that, sir.

(The information referred to is as follows:)

It is entirely correct that the seven ammonia oxidation lines at the Sunflower Ordnance Works were ample for the nitric-acid needs of the works during World War II and are still ample for full-scale production of the plant. The pilot plant now being installed at Sunflower has no relation to the production needs of the plant. It is a test of the process only, which, if successful, will be revolutionary in the nitric-acid business. The conventional process for the manufacture of nitric acid utilizes ammonia as a raw material. The new process does not use ammonia and thereby greatly relieves the national problem of providing sufficient ammonia for agricultural and military needs. In addition, the new process lends itself for field production of nitric acid, a problem in which the Department of Defense has a current interest. This was a project covered in the fiscal year 1951 industrial mobilization budget. Its location at Sunflower was insisted upon by Ordnance, when the contractor having license rights to the process proposed that it be located at his own plant, a few miles from Sunflower. The cost of $2 million includes the design and erection of the pilot plant together with 6 months of continual test operation. The resulting nitric acid, if the plant is successful, can be utilized at Sunflower in lieu of opening up another ammonia oxidation unit in the works.

ALLOWANCES ON TABLES OF EQUIPMENT

Mr. SCRIVNER. Returning to General Reeder's general statement, there are several things mentioned that did not provide me all the information necessary. Referring to page 3 of your statement, in connection with allowances on tables of equipment, you say:

Another 40 percent is allowed but the requirement is met by the substitute item so far as it is available.

That is 40 percent of what?

General REEDER. Of the table of equipment. You see, that ties in with our belief that troops can train successfully with 50 percent of their table of equipment.

Mr. SCRIVNER. That seems reasonable in most instances.

General REEDER. For the troops in training in this country during the first year of the war, as well as for the civilian components in peacetime, we propose to make available to them 50 percent of the equipment, and in order that they may be kept up with changes in equipment 10 percent of the total, or one-fifth of their equipment, will be modern, where there are new items.

Mr. SCRIVNER. And the other 40 percent will be made up of substitutes?

General REEDER. Yes.

Mr. SCRIVNER. And by substitutes you mean older equipment?

General REEDER. That is right.

Mr. SCRIVNER. Usable, but not modernized?

General REEDER. That is right; yes, sir.

CIVILIAN COMPONENT EQUIPMENT AFTER ACTIVE DUTY CALL

Mr. SCRIVNER. Then we were discussing some of these situations relating to equipment for units and reference was made to the fact that possibly a National Guard unit had completed its training and was to be sent overseas. I was not quite clear in my mind exactly what you said would happen to the material which the guard or the Reserve unit, whichever it was, had used, and where they would get the new material for their overseas duties?

General REEDER. They would probably draw the new material for overseas, if we could possibly do it, at the time they went on extended maneuvers, just before going overseas, and would leave their old equipment in the camp which they vacated to go on maneuvers, so that a newly activated division moving into that camp would take over the old equipment and commence training.

Mr. SCRIVNER. How do you offset that so we are quite certain that there is not any duplication in that calculation?

General REEDER. We do that by providing in line 5 (a) for the number of troops who are expected to go overseas according to the war plan in the first year of war, but who are not in the active Army today.

Mr. SCRIVNER. I shall go into that in more detail later on.

CLASS IV MATÉRIEL

Now we get down to this class IV matériel much of which, as I remember your statement, would be included in your item, "Other approved requirements"?

In other words, installations that were not typical, as we normally understand installations—for instance, testing grounds, and so forth?

General REEDER. No, sir. There are two places where you may find that.

Mr. SCRIVNER. I am referring to your statement on page 4 where you say:

For example, the building of roads in rear areas requires earth-moving equipment—

General REEDER. That would be in line 6.

Mr. SCRIVNER. And you say:

The units which might do this work have the necessary equipment as part of their T/E, but should we utilize indigenous labor to any extent, the equipment is not covered.

Where are you going to cover it?

General REEDER. This is essentially what we call project equipment. When you are going to fight in a given area, you look it over and find that the docks have to be improved; that you have to put up quonset huts to some extent to provide warehousing and housing; and if you are going to build airfields, you have got to have bitumen. The bridging equipment is another item which runs quite high. Each of the engineer construction outfits starts off with a bridge but once they place that bridge, they have to have more as they go along and each bridge is normally left in place. So we provide in this "other approved requirements," the best estimate of what will be needed in that form of matériel.

Mr. SCRIVNER. Of course, that will apply only to certain types of equipment and not all types generally.

General REEDER. That is right.

UNATTAINABLE OBJECTIVES

Mr. SCRIVNER. On page 5 we find a statement:

Hence, you should provide all of the medium tanks that you will require in the first year of the war prior to declaring war.

What year is that?

General REEDER. Whenever it happens.

Mr. SCRIVNER. How can you do that? This is your language:

That you will require in the first year of the war prior to declaring war.

General REEDER. That is right. If you wish to be fully ready, that is what you should do. We are not doing that.

Mr. SCRIVNER. I think I understand now what you mean. What you mean by that is that if by some occult science, we can anticipate when war is to be declared and that during the year prior to that declaration, we should provide all these things. But how are we going to know when that year begins?

General REEDER. That was the problem with which we were faced. If we were to get produced and delivered all of those tanks then we would shut down the production of them. Then we would be worse off because we would later have to start all over again on the production line.

Mr. SCRIVNER. What are you going to do about the year before the war when war is not declared?

General REEDER. That is the exact situation in which we are now.

Mr. SCRIVNER. You did not have any year prior to Korea to make that preparation?

General REEDER. That is right. We had a dandy legacy from World War II which has carried us thus far.

Mr. SCRIVNER. And you made some rather profligate expenditures from that legacy, too, as some legatees are prone to do. We can understand some of the difficulties here in projecting your requirements into the future.

General REEDER. Yes, sir. This is almost an insoluble problem. If we run the production line like mad and get the equipment, and are ready, then we have to shut down your production lines, having dislocated the civilian economy, and are considerably worse off because we have shut down the production lines. Also, we would have an awful lot of equipment on hand which could be rendered obsolescent either by our own progress in research and development or by the enemy's.

Mr. SCRIVNER. Or by the passage of time?

General REEDER. That is right. So we have a problem of which there is no fixed solution, no good solution. We just have to live with it the best we can.

OBJECTIVITY OF AMMUNITION ESTIMATES

Mr. SCRIVNER. On page 7 of your statement you discuss the subject of amunition and you say:

> In this category we estimate that expenditures in Korea, plus training consumption during fiscal year 1953, will amount to $2,409,000,000, or approximately 65 percent of the entire appropriation requested.

I have glanced rather hurriedly over a few of these estimates on ammunition. The figures do not seem quite realistic. Will you please take one of these sheets on which you make your estimate for ammunition?

General REEDER. Would you prefer the 155 howitzer which at the moment is a rather interesting item.

Mr. SCRIVNER. We should discuss this first off the record.

(Discussion off the record.)

PROGRAM PLANS FOR EXPEDITING PRODUCTION

Mr. FLOOD. I have a notation of $2,100,000,000 that you have marked for expediting production. I see we have obligated $800,000,000.

General REEDER. A little more.

Mr. FLOOD. We discussed at some length yesterday this fabulous $400,000,000 transfer deal. I will not go any further on that. Anyhow, you indicate you are going to transfer $400,000,000 for the purchase of end items. Now I would like to know what you are going to do with the other $900,000,000.

I would like to see a very carefully itemized program for expediting production for the remaining $900,000,000.

General REEDER. We can do that.

Mr. FLOOD. If there is to be any cutting, that is a nice place to go to work on it right there, because I cannot find anything on the $900,000,000—$2,100,000,000 is your over-all figure.

(The information requested is as follows.)

STATEMENT ON EXPEDITING PRODUCTION FUNDS

(As indicated in the tabular summary below the balance to be obligated of $864,919,496 is divided: (*a*) $421,480,016 for approved projects; (*b*) $150,856,414 for projects pending approval; and (*c*) $292,583,066 for proposed projects. The lists of individual projects have been furnished the committee separately because of the classified nature of the information.)

OBLIGATIONAL AUTHORITY

1.	Total appropriations fiscal year 1951 and fiscal year 1952	$2,100,000,000	
2.	Reprogramed to procurement of end items	400,000,000	
3.	Available for obligation		$1,700,000,000

OBLIGATIONS

4.	Obligations incurred as of Jan. 31, 1952, on approved projects	$813,012,310	
5.	Unobligated:		
	a. Against approved projects	$421,480,016	
	b. Against pending projects	150,856,414	
	c. Against proposed projects	314,651,260	
	d. Total unobligated	886,987,690	
6.	Total obligations		1,700,000,000

PROGRAMS

7.	Projects approved through Feb. 28, 1952	$1,198,615,003	
8.	Additional projects approved through Mar. 7, 1952	57,945,517	
9.	Additional projects pending approval Mar. 8, 1952	150,856,414	
10.	Additional projects to be programmed	292,583,066	
11.	Total program		1,700,000,000

General REEDER. Right, sir.

Mr. FLOOD. You have obligated $800,000,000.

Mr. SCRIVNER. While you are on that request, Mr. Flood, why not also request an accounting of the $800,000,000 and tell us where it is going.

Mr. FLOOD. Yes.

Mr. SCRIVNER. That should be easy.

Mr. FLOOD. Then I can see, although we could not agree on it, that you are taking $400,000,000. You are taking it from what we thought was an earmarked fund, and what we still think is an earmarked fund. We thought we had wrapped that one up pretty nicely, but apparently we did not because you are going to transfer it for the purchase of end items anyhow. What is the specific program for that remaining $900,000,000 of the $2,100,000,000 for the expediting of production in view of all the discussions we have had on the expediting of production and our debates here about an analysis of your production schedules, and everything else? I have suddenly become very unhappy about production and procurement.

(Discussion off the record.)

USE OF FORM 519B

Mr. SCRIVNER. General Reeder, we have just gone over some of these figures that have been furnished us on some Forms 519B in which, without mentioning the items or the exact figures, we find that some of your estimates for expenditure for 1952 based on the actual figures up to the 31st of December would show an exaggerated estimate, in some cases going up as high as seven times the number in the last 6 months of 1952 as were actually expended in the first 6 months. Some of the items do not run that high. Some of them work out fairly logically, but the cost of some of them runs all the way from $10 up to $50, $65, and $70. So in view of this situation, Mr. Chairman, I am requesting that we have the staff, so as not to take so much time of the committee, sit down with whoever General Reeder will designate in order to follow up similar questions on some of these many other items which I have not had the time and did not care to take the time of the committee to go into now.

Mr. RILEY. All right. General Reeder, will you designate someone to get that information?

General REEDER. Yes, I will.

Mr. SCRIVNER. This Form 519B is rather illuminating and it brings us a form which is very close to what the committee has been suggesting during previous years. In other words, you now have a work sheet for us in which you take certain figures and then, when all the computations are made we come up with a final figure upon which the budget can operate. As I say, it is a big step forward as far as we are concerned, because for the first time now we are able to sit down with you and go through the mathematical formula upon which you now operate. Of course, whether it is going to be as valuable as it should be depends on a great many things. First, whether some of your assumptions are correct. As we went through some of these items it looked as though the assumption figures for combat consumption in fiscal 1952 were exaggerated.

General REEDER. That is right, sir.

Mr. SCRIVNER. So if this is to be of as much value as we would like to have it, we will have to have a rather conservative assumption on these things. If your assumptions are wrong, in other words, if they are clear out of line and are way too high, then of course that throws all your other computations out of balance.

General REEDER. Yes.

ACCURACY OF INVENTORY FIGURES

Mr. SCRIVNER. So that is one of the weaknesses of this form. The other is the matter of your inventory. How exact are your inventory figures?

General REEDER. I hesitate to say they are exact within this percentage or that. First of all, I would like to say something on the earlier part of your question.

Mr. SCRIVNER. All right.

General REEDER. The Army is an enormously large business.

Mr. SCRIVNER. No one realizes that better than the members of this committee.

General REEDER. At the level on which all of these gentlemen are operating, what we get and what we work on really is ancient history, or a long look ahead.

Mr. SCRIVNER. Or somebody else's calculations rather than your own.

General REEDER. Of course, that is true. These are not our calculations. When I look at these things I look to see whether they make sense, and that is all. These forms which you have now, because of the magnitude of the task were developed probably in the late summer of last year. The only data which could be properly used in forecasting the 1952 consumption of ammunition was the rate which had been approved at the insistence of the Far East Command, at which they said they could fire ammunition. The figures which vary therefrom are the hard facts which we accumulated since then. The business of trying to bring them back there again is a matter of months of work to get them back together. We have to do that as a normal thing, steadily reprograming where we found our guesses were too much, and padding up where we guessed too low.

So this is not an alarming thing.

Mr. SCRIVNER. No; it is not alarming, except for this: When you are dealing with a tremendous number of items such as rounds of ammunition, if the estimate is over, let us say on one specific shell in the amount of 2,000,000, and that shell costs you $65, or for the purpose of easy calculation let us say $60, then there is $120,000,000 right there, which even in this day and age of billions is not any small change.

General REEDER. That is right, sir.

Mr. SCRIVNER. When you come into some of these bigger items of hardware and as an example, let us take the item of tanks, which costs more than a quarter of a million dollars, if the estimate is high by even 100 tanks you are again going into tremendous sums of money, because there is another $40,000,000. Those are some of the things that do worry us considerably.

General REEDER. Let me go on, because you asked about the inventory, which I have not answered.

Mr. SCRIVNER. Yes.

General REEDER. To guarantee the inventory to a given percentage I think would be idle. Let me say rather what our inventory position used to be and what we have done about it.

At the end of the war we demobilized and the boys could not get home too fast. We had great quantities of stuff which was either dumped or was hastily boxed in order to get it home. It took us a long time to sort that out and deal with it and find out what we really did have.

Mr. SCRIVNER. That is on your smaller items, but now on any item that has a value of, let us say, $1,000, $2,000, or $5,000, how accurate is it?

General REEDER. Let me go on to try to tell you some of the things we have done. We became aware that our inventory was very lacking in that we had to presume that the units of the Army had all their equipment. We had no report on them. We now get a report which covers between 1,100 to 1,200 items, from all units, posts, camps, and stations, which comes in through the Army. It operates something like a morning report to get a report of change when they add to their equipment or subtract therefrom. That was a new thing and the-

oretically is wonderful. We found after we had gotten the people indoctrinated into doing it, though, that they made many misinterpretations. So we had a correction job on that.

We are introducing that system overseas, so that we will get back better reports. Our depot inventories have been brought up to what I really call good shape. I do not think we are in any large item apt to make a serious error in inventory unless it be in Korea and the Far East.

Mr. SCRIVNER. Certainly on an item as expensive as a tank you should have an exact inventory.

General REEDER. That is right.

Mr. SCRIVNER. If my recollection is correct, I was told not too long ago that it was impossible to give this committee an exact inventory of tanks.

General REEDER. Well, I would not be willing to back that statement. I will produce you an inventory of tanks if you would like.

Mr. SCRIVNER. Then how can we tell how near correct it is?

General REEDER. I do not know that you can.

Mr. SCRIVNER. That is what I am talking about. I would not, at this time, quibble about these smaller items. Those things move so fast, like rounds of ammunition, and all that, but you do not easily lose tanks and there is no inducement for somebody to try to take one of them home for a souvenir, or peddle it. So that on an item costing a quarter of a million dollars certainly we should have an absolutely exact inventory on it for several reasons. In the first place, we ought to be better bookkeepers and housekeepers than that. In the second place, if that figure is not correct, when we start working from your Form 519B and the inventory is not correct, then that in itself, of course, throws off all your other calculations.

General REEDER. That is correct.

Mr. SCRIVNER. If there is any element of even 5 percent of error when you are dealing with a program as big as the tank program with items costing that much in it, the taxpayer is hit pretty hard.

General REEDER. I can say in answer to that that in the time I have been around this G–4 business, which is almost 4 years now, I am morally certain that our inventory has improved tremendously. I mean, our knowledge of our inventories; and that they are continuing to improve. There is a safeguard in that because we have a procurement goal, that is, an eventual procurement goal far beyond that which we are approaching in fiscal year 1953. Since we are not buying nearly all the stuff we shall have eventually to buy if we attain a condition of full readiness, there is some time before us to make further correction of our inventory position.

Mr. SCRIVNER. The bigger this program becomes, the more important it is to have more accurate inventory.

General REEDER. That is right, and as we go on with it I believe the exactitude of our inventory will improve, as it has in the past; although I believe we have eliminated the great areas of doubt by getting through the unclassified equipment which we had at the end of the war and by bringing the overseas commands into better coordination.

Mr. SCRIVNER. Of course, in your inventory on a lot of these items it should improve considerably. Your rehabilitation program is one of the things for which the Army can be highly commended. I saw

it in operation 4 years ago when I was overseas, and now it has been stepped up even tremendously above that, and the Army has salvaged from many of the places in the Far East, where we thought the items were gone forever, a tremendously large number of vehicles of various types, plus other equipment which has now been rehabilitated and which did make it possible for some of those items to get to Korea much more quickly than would otherwise have been possible.

I am quite sure many of those items had been dropped from the inventory a long time ago just because nobody knew where they were or how many there were. So your inventory on those items should show a considerable change if they have been picked up, and I do not know whether they have or not. Probably not. A lot of them probably just went right on into Korea without much counting being done.

General REEDER. I suspect that that is the case because I am quite confident that the human tendency to hoard applied overseas to a certain extent. That can be affected by being good supply people. The more able we are to supply the troops promptly with what they want, the less will be their tendency to hide stuff out and so have an undisclosed inventory at any given time. Really, the accuracy of our inventory is affected also by the efficiency of the operation. You cannot hide a tank out, but there is an awful lot of stuff which runs into money which has been hidden out in the past and will continue to be, as long as the people can get away with it and feel that there is any reason for it.

(Discussion off the record.)

Mr. SCRIVNER. Back on the record, and let us get back to Form 519B. We discussed a while ago combat consumption, which is item No. 1. Then we come down to item No. 2, which is initial equipment. You have item a under that, entitled "Regular forces."

First, what do you mean by "Initial equipment" and, second, what do you mean by "Regular forces"?

DEFINITIONS OF BUDGET TERMS

General REEDER. Initial equipment means that which is issued either to troops or installations for use during this fiscal year in question.

Mr. SCRIVNER. What do you mean by "Regular forces"?

General REEDER. The Regular forces are the active army. Whatever forces are on active duty.

Mr. SCRIVNER. Whether it is a Regular Army unit, or whether it is a National Guard unit, or a Reserve unit?

General REEDER. That is right.

Mr. SCRIVNER. But for this purpose they are all called Regular forces?

General REEDER. That is right.

Mr. SCRIVNER. And it does not apply to the Regular Army only?

General REEDER. That is correct.

Mr. SCRIVNER. What do you mean by organization units? Is that a company, battalion, or a regiment?

General REEDER. Yes. Those are the units which have either a table of equipment or a table of allowance issued to them.

Mr. SCRIVNER. That does not quite clear it up for me when you say organization units.

General REEDER. Companies, regiments and battalions.

Mr. SCRIVNER. All right. What do you mean by "Installation support"?

General REEDER. There will be equipment issued in some fields which is not used for the same purpose as for troops. A sample of that would be the equipment you find in the——

Mr. SCRIVNER. In the camp headquarters?

General REEDER. Yes. Some of that.

Mr. SCRIVNER. In other words, if you had a training area where you were sending in new troops for troop training, the headquarters of that area as distinguished from the units in which the men were trained would have certain equipment, whether it was communication, transportation, or many other items?

General REEDER. Yes, sir. It is often hard to distinguish between 2 and 3—between installation support and training.

Mr. SCRIVNER. Installation support would be in any camp or station, would it not?

General REEDER. Yes, it could be.

General DECKER. An example of that would be the equipment of the post engineer which he uses in maintaining the post, like his bulldozers and graders.

Mr. SCRIVNER. And trucks.

General DECKER. Yes.

Mr. SCRIVNER. How do you define item a (3), which is "Training"?

General REEDER. That you find where the schools have an allowance, based usually on the number of students, of equipment for their training. The same is true of the replacement training centers and similar institutions. In stead of giving a training division, which carries a regular divisions number, the regular division equipment, they have what is necessary to train the people that they are going to have.

Mr. SCRIVNER. For instance, you go into an infantry training camp such as Fort Riley. Most of those men going through are replacements.

General REEDER. That is right.

Mr. SCRIVNER. So that at Fort Riley, for instance, where they are training the Tenth Division, they will have certain items of equipment. They will probably have some BAR's that are there permanently.

General REEDER. That is right.

Mr. SCRIVNER. And some mortars.

General REEDER. Correct.

Mr. SCRIVNER. Which stay right there at Fort Riley solely for the purpose of training replacements, so that they will not have any organization unit as we normally think of it.

General REEDER. That is right.

Mr. SCRIVNER. So when this group of replacements, for instance, should be formed into a complete battalion at Riley and should be moved into the unit, then that battalion would be provided certain organization equipment.

General REEDER. Yes. Separately from——

Mr. SCRIVNER. Separately from your training stuff.

General REEDER. Yes.

Mr. SCRIVNER. Then a (4) is "All other." What does that cover? All other what?

General REEDER. Well, there are sometimes justified uses which do not fall directly into any of those categories. I cite one I happened to remember, in the opening statement, on White Sands. Quite often you will have stuff in support of a research and development project. I believe that we did show a requirement here for a project 414 (a).

(Discussion off the record.)

Mr. SCRIVNER. For instance, getting back to our favorite subject of tanks, that would be some of the tanks which you have up at Edgewood. They are up there purely for research and development.

General REEDER. To be worked over.

Mr. SCRIVNER. And for use in demonstrations.

General REEDER. Yes.

Mr. SCRIVNER. All right; 2b is "Civilian components." That takes in ROTC, ORC, National Guard, and all of those similar units.

General REEDER. That is right.

ITEMS INCLUDED IN PEACETIME CONSUMPTION

Mr. SCRIVNER. That brings us down to item 3, which is called "Peacetime consumption." Do you have any particular formula upon which you base "Peacetime consumption"?

General REEDER. Yes.

Mr. SCRVINER. Is it based upon history?

General REEDER. Yes, sir. Based upon experience, we use factors which make sense and calculate the consumption. Take a pair of shoes. It is expected to last a year. So they use a monthly factor, which would be 1 divided by 12. The factor for combat unit is higher.

Mr. SCRIVNER. Let us take some other item than shoes. That is getting into Quartermaster and we have been talking about Ordnance largely.

General REEDER. All right.

Mr. SCRIVNER. For instance, taking something we can all understand, how do you determine the peacetime consumption of a Garand rifle?

General REEDER. Some of them wear out. I do not think we have a form.

Mr. SCRIVNER. What do you have a form on here?

General REEDER. The man who does that calculation either knows or can find out very quickly what the peacetime factor is. I think another one is the equipment such as the earth moving equipment in the hands of troops. We use a little greater life on that than a contractor does.

Mr. SCRIVNER. As peacetime uses?

General REEDER. Yes, sir. There are two things to consider there. One is that we do not run it as much time as he does but, on the other hand, we operate it with less skilled workmen. After some discussion on it we use 8 to 10 years for the life of that type of equipment, and then reduce that to a monthly factor and multiply it by the population in use.

Mr. SCRIVNER. Then 3–a is fiscal year 1951 and 1952. Why are those lumped ogether? 1951 could be an actual figure, could it not, and part of 1952?

General REEDER. No, sir. Let us be real honest. I am very deep in this game in trying to bring together all the figures that we developed, and the making of records and the use of same is of extreme interest. It is an expensive process to make records and it must pay for itself. We control our supply by the demands on the depots of the United States, which is where it really originates, whether they go overseas, or to posts, camps, and stations. So we use for that purpose a very different form than this, called a Supply Control Study, which endeavors to predict issues, keeps a record of past issues, and comes out with a demand on United States depots. But that does not reflect and there is nowhere in it that you can pick up the actual consumption.

Mr. SCRIVNER. So your fiscal 1951 and 1952 is a calculation?

General REEDER. It is a calculation. That is right.

Mr. SCRIVNER. Based on past information?

General REEDER. Yes. The problem of how to get that kind of data and use it here, and use it cheaply—I mean in terms of manpower and civilian employees, which is what it is in the end, and which is something about which you are very sensitive as to the number—how to do that is a big problem not readily solved.

Mr. SCRIVNER. I can understand that. Let us take for instance the fact that the Quartermaster in Research and Development has brought out items of wearing apparel with new material which they tell us will stand much more wear and tear than a previous item. How does that fit into your machine to make a change on your estimated peacetime consumption?

General REEDER. Yes. That will come in practically as a correction after we get a little experience with it. The people who say it is going to last so much longer are always the enthusiasts and the Research and Development people.

Mr. SCRIVNER. That is right. It does not always work out in the field the way it does in the laboratory.

General REEDER. That is right. The supply people do not believe it. They go on with the old factor until they have something to prove that it is different. That is. when they get that or the intimation of it from the supply-control study.

We have checked a number of items particularly in the Quartermaster last year when we were being belabored about pepper and what not—we checked the supply-control study against this type of calculation, so that if it did not agree or come somewhere near agreement as to what the procurement demand was, we took the lower of the two. This you must recognize is not a working sheet. This is the same thing as a company balance sheet. Here are your liabilities and here are your assets.

Mr. SCRIVNER. I am not down to that yet.

General REEDER. That is not a document with which we can work from day to day. We have worked out a new supply-control form. It is not a perfect form of supply-control study but we are working hard trying to find a way in which the data shown there for actual operation can be quickly transferred to this.

You had asked about the rifle. May I make that answer?

Mr. SCRIVNER. Yes.

General REEDER. The rifle is supposed to wear out in 16⅔ years. In other words, the monthly replacement factor is 0.005.

Mr. SCRIVNER. So that for a year that would be 0.060?
General REEDER. Yes.
Mr. SCRIVNER. Then you will follow pretty much that same pattern in estimating 3–b, which is fiscal year 1953?
General REEDER. That is right.

DEFINITION OF LEVELS OF SUPPLY

Mr. SCRIVNER. What is your interpretation of "Levels of supply," which is item 4?
General REEDER. The level of supply depends upon the location of the items being supported. If they are overseas, the stock required to issue, what is required and still in the depots in the United States, and all those in transit, amounts to 6 months of the use.
Mr. SCRIVNER. In other words, that is what we normally refer to as the pipeline?
General REEDER. Yes.
Mr. SCRIVNER. The amount of time it takes to get a rifle or a uniform, or items of food, or whatever it may be, from the contractor through your depots to your ports of embarkation, aboard ship, unload it at debarkation, and on up through your depot supply clear down to your ultimate user in the units?
General REEDER. That is right, sir.
Mr. SCRIVNER. All right. I think that is something we can fairly well understand.
General REEDER. In the combat support that is 6 months long and that same thing holds true for other overseas units in the combat support. But in the peacetime basis there are two calculations. One is for the zone of the interior in the United States, a 3½-month pipeline, and overseas 6 months.
Mr. SCRIVNER. Which is practically the same as combat support.
General REEDER. Practically the same thing.
Mr. SCRIVNER. Normally there would not be any considerable difference in the calculation there except possibly in interference with shipping.
General REEDER. Full combat is very different. It lengthens out because then there are all the delays due to convoys, and so on.
Mr. SCRIVNER. And handling.
General REEDER. Yes.

CALCULATING MOBILIZATION RESERVE REQUIREMENTS

Mr. SCRIVNER. Item 5 is "First year of war," which is "Mobilization reserve." How do we arrive at that?
General REEDER. That is done in three steps. First in line 5–a we take all of the forces which are to be shipped overseas in excess of the active Army.
Mr. SCRIVNER. All right. Let us take an example.
General REEDER. We can take a 5-ton truck, which you were thinking about.
Mr. SCRIVNER. No, I am thinking now about units. Suppose we have today overseas five divisions and it is anticipated then that there will be immediately sent from this country another five, plus some others. In other words, we are talking about what happens if it become necessary to enlarge our forces, are we not?

General REEDER. That is right.

Mr. SCRIVNER. If necessary, we are going to move from five divisions up to X number, whatever it may be. You take that number and multiply it by the initial equipment that you will need for those troops, plus what?

General REEDER. Plus nothing. Let me just clear that up a little bit more and in going over the record I might vary it.

Mr. SCRIVNER. All right. I am doing this for a particular reason, to see if I can understand it and if the committee can understand it in more detail than just merely the words here.

General REEDER. All right. Let us suppose that our war plan envisaged the deployment overseas of, let us say, 22 divisions, just to pick a number, during the first year of war. We have already provided up here in line 2 for 20 divisions to be fully equipped. Therefore we must provide for full equipment for two more divisions which would go overseas. It so happens that in keeping a peacetime organization we generally accent combat troops and divisions at the expense of some of the supporting artillery and a great deal of what we call service support, such as Ordnance, maintenance companies, Signal outfits, and Engineer battalions.

Mr. SCRIVNER. Of course, many of those would have to be initially equipped?

General REEDER. Initially equipped. Yes; and there would be proportionately more of those than divisions because we have shortchanged ourselves in peacetime.

FURTHER DEFINITIONS OF FORM 519B TERMINOLOGY

Mr. SCRIVNER. That is clear enough. 5–b is "Combat and training consumption." You had training consumption under 2–a. Is that included in 5–b?

General REEDER. No, sir.

Mr. SCRIVNER. Is in addition to?

General REEDER. This is for wartime plans.

Mr. SCRIVNER. That is in addition to?

General REEDER. That is right. This is the average troop strength overseas times their rate of consumption for that first year. To that you add any increase in training consumption above that which you have provided for up in three.

Mr. SCRIVNER. In other words, that would be actually in training consumption for the increased number of troops?

General REEDER. Of troops in this country. That is right, sir. For example, you go into pretty violent maneuvers just before a division goes overseas, and they really eat up a lot of equipment at that time.

Mr. SCRIVNER. Then 5c is "Increase in level of supply." That is what we were talking about a while ago. In No. 4 we were talking about levels of supply primarily in peacetime.

General REEDER. Yes.

Mr. SCRIVNER. So this item of "Increase in level of supply" takes into account the added hazards and delays incident to war.

General REEDER. That is right, sir. For example, as you have said, suppose we have 6 divisions in Europe and we went up to 22 by the end of the year. At the end of the year our pipeline would have to support that 22 divisions. Not the average during the year, but at the end of the year you have a huge pipeline.

Mr. SCRIVNER. Plus a longer lead time?

General REEDER. We are not allowing for the longer time. We are sticking to 6 months on that. It is conservative if you look at it one way.

Mr. SCRIVNER. Have you taken all of those things into consideration that brings you down to item 7, which would be the "Total requirements," without considering at all what you already have?

General REEDER. Yes.

Mr. SCRIVNER. This just says that when we add all these things up this is what we should have or have to have to carry on all these things.

General REEDER. That is the total liability.

Mr. SCRIVNER. Then item 8 says, "Less already provided for." Item 1 would be your stocks on hand. That is inventory.

General REEDER. That is right.

Mr. SCRIVNER. In other words, there again we come down to a factor that, depending upon a good inventory, gives a fairly accurate picture. If it is not, then, of course, the picture is distorted to the extent of the distortion of your inventory. We can understand the inventory all right. What do you mean by "Primary items"? That is a (1).

General REEDER. Where we are changing the type——

Mr. SCRIVNER. What would be an example of a primary item?

General REEDER. Let us change to a different subject, such as the self-propelled artillery. The T–98 is a new self-propelled gun. There is a World War II gun of approximately the same caliber, not so good. What is its number? It is M–37, M–7, and M–7D1.

Mr. SCRIVNER. So that you would have on this item an inventory which would include some of your new weapons and some of your old which could be used in lieu of the newest weapons?

General REEDER. That is right, particularly for training.

Mr. SCRIVNER. That might also be true of some today if we get into some of these newer concepts. For instance, you might replace even the Garand rifle with a newer caliber .30, whatever you might want to call it.

General REEDER. Yes.

Mr. SCRIVNER. Subparagraph (*b*) says "Fiscal year 1951 and prior years (including on order June 30, 1950)." Is that what you actually have, or what you have ordered?

General REEDER. That is the amount that has been appropriated for. The amount that has been appropriated for and since 1951 put on order. In order to give the full picture since you always have a carry-over in this long-term procurement business, we have included everything that was on order June 30, 1950.

Mr. SCRIVNER. So that this item would include everything for which you had been given money, whether it was actually——

General REEDER. Whether it had been delivered or not.

Mr. SCRIVNER. Whether it had been delivered or not.

General REEDER. Yes.

Mr. SCRIVNER. But at any rate, it was in process.

General REEDER. That is right.

Mr. SCRIVNER. Plus everything that you had ordered up to June 30, 1950.

General REEDER. Not everything.

Mr. SCRIVNER. It says, "Including on order."

General REEDER. Yes, sir, but I do not think you mean quite what you said. You said everything we had ordered up till then.

Mr. SCRIVNER. That is what this says: "Including on order."

General REEDER. But it should not. On order, but not delivered.

Mr. SCRIVNER. On order even though not delivered?

General REEDER. No. On order and not delivered. If it had been delivered it would show in the inventory.

Mr. SCRIVNER. Then of course when we come to fiscal 1952 that would be the number of items which you intend to procure with 1952 funds.

General REEDER. That is right. Whether obligated or not.

Mr. SCRIVNER. That is what I say. What you intend to procure with 1952 funds.

General REEDER. That is right.

Mr. SCRIVNER. That, of course, may be subject to change.

General REEDER. Yes.

Mr. SCRIVNER. You may have anticipated when this list was made that you were going to order 300 of some item and you find for some reason or other that you are going either to drop it entirely or increase it maybe to 3,000.

General REEDER. Yes.

Mr. SCRIVNER. So when you take these items in subparagraphs a, b, and c you then deduct them from your total requirement?

General REEDER. That is right.

Mr. SCRIVNER. And that remaining figure will then tell you what you have yet ahead of you to procure?

General REEDER. That is right.

Mr. SCRIVNER. Whether it is in 1953, or 1953 and subsequent years.

General REEDER. Right.

Mr. SCRIVNER. Mr. Chairman, I have taken up more time than I intended, but I felt for my own understanding of some of these figures and probably the understanding of the staff and the committee in their study of the figures presented to us that it was necessary to get a little more comprehensive picture of this form 519B. I wish to apologize for prolonging it.

Mr. RILEY. It was necessary and I am glad that you brought out these items.

Mr. SCRIVNER. May I ask one more question on this general statement?

Mr. RILEY. Yes; go ahead.

EXPLANATION OF CONGRESSIONAL ACTION ON APPROPRIATION REQUESTS

Mr. SCRIVNER. I just want to call your attention, General Reeder, to page 8 of your general statement where you are talking about the reprograming effort, and the budget presentation, and so on. If left as you stated, some persons probably would feel that Congress had been pretty derelict in its duties in taking an unduly long time in providing funds for the Defense Department.

Now, as a matter of fact, while you say—and we are talking about fiscal 1952 here:

The full appropriation, as you know, was not passed until October 18, 1951.

As a matter of fact, the budget presentation was not given to Congress until April, as I recall it.

General REEDER. That is correct.

Mr. SCRIVNER. Which was no fault of the Congress and perhaps there is no justifiable criticism to be leveled at the Department of Defense either, because immediately prior to the presentation of fiscal 1952 requests for funds, the Department of Defense and the Congress and this committee in particular had been dealing with three supplemental requests added to the original request of 1951. My recollection is that the hearings on some of those supplementals were resumed immediately after Congress came back into session in the middle of December.

This committee—and when I talk about this committee now I mean the Military Appropriations Committee—started in on those hearings and went clean on through almost in daily, continuous session, from 10 in the morning until late in the evening with only two periods intervening, if my memory serves me correctly. One was 5 days and the other was an 8-day period. While the military were not present at all times, after the hearing was concluded then we had to go into the marking up and the presentation of the bill to the House. Then immediately following that we had a conference with the Senate. Those things being completed, then the Defense Department was able finally to get their 1952 budget prepared and presented to us, and hearings were held on that. The matter was then presented to the House and Senate conference and finally passed by October.

So that while the statement as you made it was correct as far as it goes, the statement was not quite complete and this dissertation does complete it.

General REEDER. May I state on behalf of the Army that this was made solely as a statement of fact to show a condition, and was in no sense meant as any reflection on this committee, which has certainly worked as hard as anyone could ask for, and has been most helpful to us. The whole business of the time of appropriation last year was a combination of circumstances and situations which were possibly a little beyond all of us.

Mr. SCRIVNER. Then finally on page 9 you point out one of the things to which other members of this committee and I have made reference on several occasions, namely, where you say,

> Finally, there is no great compelling urge of patriotism similar to that of a full scale shooting war in the situation we now find ourselves.

If I understand your position, and perhaps you understand mine—I do not know—but from all reports we have been getting from Korea this has been pretty much of a shooting war in itself.

General REEDER. That is right.

Mr. SCRIVNER. Although you describe it as a "situation," you do pinpoint something, though, that I have tried to stress to every member of the military, from the Secretary of Defense on down. That is that I feel there has not been enough recognition of the fact that this is a war. It has not been stressed enough not only with our men in the service and the military themselves who are not in Korea but particularly as it relates to industry and labor.

I say that because I am quite sure that if it were brought home to the American people, and I mean by that pinpointing even more than it was in World War II, that this is actually a war situation, some of our troubles would perhaps not be eliminated, but at least would be dimin-

ished. I have not yet lost faith in the American people, either the employers or the employees. Of course, you apparently recognized maybe not exactly that, but that a situation does exist.

General REEDER. If you were in the supply game, sir, you would appreciate that there is a shooting war in trying to meet the requirements.

Mr. SCRIVNER. The figures you have given us on the expenditure of ammunition certainly demonstrate that, and certainly the casualty lists that are now at over 106,000 in combat plus a recent report of 400,000 noncombat certainly indicate that it is anything but a powder-puff job.

Mr. RILEY. General Reeder, you may proceed to the consideration of your next item.

General REEDER. I think the committee may wish to proceed to the consideration of the details of the appropriation and if the committee please, we should like to take the Ordnance Corps entirely through their part of the appropriation, except industrial mobilization measures, which we shall deal with as a whole. I think by so doing we can save your time and do a better job. So, if we may, we will start with project 1100, on which General Ford has an opening statement.

GENERAL STATEMENT OF THE CHIEF OF ARMY ORDNANCE

Mr. RILEY. General Ford, we are glad to have you here and you may present your statement, if you wish.

General FORD:

1. The fiscal year 1953 budget estimates for Army ordnance under the appropriation "Procurement and production, Army," as pertains to weapons only, total $441,888,000. This sum is distributed among the major categories of weapons as follows:

	Fiscal year 1953
Artillery	$123,349,000
Small arms	3,029,000
Tanks	97,123,000
Combat vehicles	218,387,000
Total	441,888,000

These estimates represent a reduction of some $3,822,414,000 for weapons for the fiscal year 1953, as compared to funds available for the fiscal year 1952 for the same or similar items. This reduction in funds for the fiscal year 1953 makes necessary the extending of deliveries of finished goods over a longer period than was planned under the fiscal year 1952 budget program. The fiscal year 1953 program, in addition to providing for the current supply of the troops, is aimed at restoring fiscal year 1952 Korean losses which were not previously provided for.

2. Since the Korean campaign began, the Ordnance Corps has sought the following objectives: (*a*) Current supply of the troops, both training and combat; (*b*) reconstitution of adequate supply levels, including war reserves; (*c*) establishment and maintenance of a production base and rate which would be capable of rapid expansion in the event of an all-out war.

3. It is, of course, always necessary to supply the troops with ordnance, and this is always our first job. Because of production leadtime it is also necessary to maintain an adequate reserve of most items of ordnance to supply the troops during the early days of an emergency until current production can meet combat requirements.

4. I would like now to describe to this committee the manner by which it is hoped funds made available in the fiscal year 1953 budget estimates will enable Ordnance to supply the troops on a current basis and also maintain an adequate production base and rate.

COMPUTATION OF REQUIREMENTS

5. General Reeder has already outlined to this committee the method of computing requirements and the means of requirements presentation on the Department of Defense Form 519–B. Essentially, the computed current requirements set forth on Form 519–B have been met. No provision has been made for requirements applicable to combat consumption in Korea for the fiscal year 1953.

6. I would like to emphasize at this time, however, that the objective of maintaining an adequate production base and rate is our best guaranty of being able to supply the troops in an expeditious manner in the event of an M-day, at the lowest possible cost. It is apparent that the production and storage of ordnance in adequate quantities to meet all of the first year's combat requirements would be extremely costly and would involve large expenditure of funds for the maintenance of such ordnance since such quantities would be far in excess of current peacetime troop requirements. In addition to the high initial cost and the current maintenance costs, advantage could not be taken in all cases of improvements resulting from our current accelerated research and development program.

7. I would like to repeat that the maintennace of an adequate production base and rate for the manufacture of ordnance will enable the Army to accelerate production when required, incorporate improvements in current production lines, and conserve the taxpayers' dollar. The quantities of weapons requested in these estimates, which are based on firm troop requirements, are sufficient to maintain on a reduced basis the production facilities which are being established up to this time.

MAINTENANCE OF PRODUCTION BASE AND RATE

8. It is our objective to maintain the present planned production base and rate with few exceptions by rescheduling and reprograming production funded with fiscal year 1951 and 1952 funds. Because of production delays and slippage and the utilization of prior year funds over a longer production period, the funds requested for weapons will be sufficient to operate under this plan.

PRICES

9. The prices of ordnance items included in this budget are based on the best information available up to the time the estimates were prepared. The prices set forth in the weapons estimates include special tooling, gages, acceptance and proof testing, transportation, and other expenses incidental to production.

10. Production contracts with American industry involving the establishment of new facilities and the production of items peculiar to the military provide for the redetermination of pricing after production experience has been attained. Generally, these contracts provide for repricing after 40 percent of the items involved have been produced. At this point a firm price is negotiated to cover the initial production, together with a new firm fixed price for the remaining production. These prices are based on production cost experience and projected estimates of production costs. This redetermination of price option may again be exercised after another production run has been attained. It is by this means that the Government receives the benefit of any price reductions and production economies made by the contractor in connection with the manufacture of new items of ordnance.

11. Because of production leadtime and production delays and slippage which have occurred up to this time, very few contracts have reached the redetermination point. Based on World War II experience covering the manufacture of tanks and combat vehicles it is reasonable to anticipate that price reductions on an average of 8 percent may be achieved. I would like to point out, however, that because of the rescheduling of current production over a longer period, greater cost may be incurred and the 8-percent saving realized in World War II may not materialize during this production effort.

12. I would like to assure this committee that Army Ordnance is fully alive to the need for conserving Government funds. I have pointed out in numerous orders, conferences, and correspondence with officers and officials who are charged with administering the Ordnance program that economy is the order of the day and that small percentage savings in the cost of ordnance items will mean significant savings to the taxpayer. I assure you that the furnishing of quality ordnance to the troops on a timely basis at the most economical cost will continue to be our objective.

ORDNANCE PLANS FOR EXTENDING DELIVERIES OF FINISHED GOODS

Mr. RILEY. Thank you, General. We agree with you as to the last paragraph of that statement. Small savings in items count up to a great many dollars.

Now, in your statement, you call attention to the fact of the necessity of extending deliveries of finished goods over a longer period. Do you have the money in hand to contract for those goods, or are you anticipating future appropriations, when you speak of extending the deliveries of finished goods?

General FORD. Under previous programing and scheduling we had planned to go up to a certain level of production and then level off. Now with the reduction in funds for fiscal year 1953, we are reprograming so that we would not go up to the same height, so to speak, because we are extending the schedule further into the future.

Mr. RILEY. In other words, you extend the use of the appropriations that you have over a longer period, a period longer than you anticipated in the first place; is that correct?

General FORD. No, sir; it does not quite work that way, if I understand your question.

Mr. RILEY. I am talking in terms of dollars, not end goods.

General FORD. We do have to figure lead time. Our program is based upon being able to pick up the production, considering the lead time, with the funds appropriated in fiscal year 1953. Our scheduling has been based upon carrying the schedule out into next year, so to speak, and then picking it up with these additional funds, instead of going up to a higher rate and thereby completing the present orders at an earlier date.

Mr. RILEY. I am a little puzzled. You say that the reduction in funds makes necessary extending of deliveries. If you do not have the dollars to buy a certain number of end items then it would seem to me you would have to cut down on the number of end items that you are going to get, unless you have your contract go on over into another year.

General REEDER. If I may suggest, sir, I believe the answer to the original question was "yes." We are extending the money now in hand over a longer period.

General FORD. Extending the deliveries, yes.

Mr. RILEY. I was speaking in terms of dollars. That is, you are extending the use of the money that you now have over a longer period of time?

General FORD. Yes, sir.

TIME LIMIT ON AVAILABILITY OF FUNDS

Mr. RILEY. Is all of the money for this procurement based on an indefinite period or will some of it revert at the end of the present fiscal year?

General REEDER. It lapses if not obligated and, if obligated and not expended by June 30, 1954, it reverts to the Treasury.

Mr. RILEY. You do have until June 30, 1954?

General REEDER. To expend it; yes, sir; and until June 30 of 1952 to obligate it. In other words, to make contracts——

Mr. RILEY. In other words, if you can get delivery within 2 years you are all right?

General REEDER. Two succeeding years; yes, sir.

Mr. RILEY. What is your ultimate over-all requirement for weapons, in terms of dollars? You say you have extended this program. Can you give us some estimate of your ultimate requirement in terms of dollars, for weapons?

General DECKER. This is only the mobilization reserve.

General REEDER. Since we have already provided generally our initial equipment, this is the remainder, and I would like to speak of this off the record.

(Statement off the record.)

Mr. RILEY. Does that cover just weapons?

General REEDER. We can break that down for you.

(Statement off the record.)

ORDNANCE PROCUREMENT FUNDING THROUGH 1952

Mr. RILEY. How much of it has been funded and contracted through 1952?

General REEDER. Funded through 1952, $1,564,000,000. I am giving that answer in terms of the cost of the mobilization reserve leaving out the equipment of the troops which is considered to have been already accomplished. It has been funded.

Mr. RILEY. Could you give us an estimated amount in terms of dollars, that you need for weapons for training purposes through 1952?

General REEDER. Normal peacetime wear-out, and so on?

Mr. RILEY. Yes.

General REEDER. $82,297,000.

RECONSTITUTION OF ADEQUATE SUPPLY LEVELS FOR ORDNANCE

Mr. RILEY. In his statement, General Ford speaks of the reconstitution of adequate supply levels. Is that the replacement of matériel that has been used in the Korean engagement.

General FORD. That is one of our objectives. That has been an objective we will say since the Korean campaign started, to get these reserves and pipeline stocks, which General Reeder discussed this morning, in connection with the Forms 519; and from our standpoint, of course, to be sure that we have an adequate war reserve of equipment as well as ammunition to carry us in case we get into an all-out war. Now, that is an objective.

ORDNANCE PRODUCTION BASE

Mr. RILEY. How much are you putting into the establishment and maintenance of this production base under item C on page 1?

General FORD. That, Mr. Chairman, is along the lines of the discussion this morning on the expediting production money. What we are essentially trying to do—and there is still something of a program left to be worked out—is to be able to organize this present program essentially on a one-shift operation with the idea that, having that capacity, then in the event of all-out war, we could go quickly into all-out production, the time lag being that necessary to get mate-

rials into the factories and get personnel trained to fabricate materials to turn out items of ordnance.

Mr. RILEY. Are you actually using your production base now on a limited scale and do you expect to expand that, or do you have some facilities standing idle?

General FORD. We have some parts of our ammunition facilities still in an inactive status or at least less than full-active status. In the case of our metal-working type facilities—I am speaking of industry now—in many cases today they are working them around the clock, because we have not the desired base that we are working toward.

Mr. RILEY. You mean you are working two and three shifts?

General FORD. Yes, sir.

Mr. RILEY. Presently?

General FORD. In certain categories.

Mr. RILEY. Are those the categories that you expect to expand with this expediting production money?

General FORD. Under the program that is now in process. We are getting additional capacity with the idea eventually of having capacity which would permit of considerable expansion in the event of all-out war.

Mr. RILEY. Could you give us some specific examples, either on or off the record, of those facilities that you propose to expand the base on, and about how much money you expect to spend on them?

General FORD. I could take as an example, for instance, our light tank. We have been in production on this tank now for several months and we are still doing certain things with respect to improving that production. I am speaking particularly of the production at the Cadillac plant in Cleveland. There we have equipment which is permitting us to meet the schedule of that tank as it is now, but as they go on with their manufacturing operations quite frequently they find that they may be able to make changes in manufacturing processes whereby they could save a machine here by such improvements. We are therefore on many of the machines and in many of the operations in that plant working more than one shift, but the plan is to bring equipment into that plant so that we could get our present schedule of production essentially on an 8-hour day or 40- to 48-hour workweek with the idea then that we will have considerable reserve capacity to take care of much larger production if we need it.

Mr. RILEY. Do you contemplate setting up another production line?

General FORD. Not for that particular item; no, sir. We have the space, so to speak, in that particular facility and as I am sure you know, Mr. Chairman, certain machines have an adequate capacity to produce more than the schedule may call for today and other machines have to work more than one shift to meet the present schedule. So it is a matter of adding to those machines to give us a condition where we could essentially get our production in about 8 hours.

Mr. RILEY. You would add machines where the bottlenecks are?

General FORD. That is right.

Mr. RILEY. In order to keep moving?

General FORD. Yes, sir.

Mr. RILEY. About how much money do you propose to spend, in this particular category, for expanding this production base?

General FORD. There are many projects now being worked on such as activating our ammunition plants and acquiring additional machine-tool type of equipment, and so forth; I am not sure that we could come up with a figure. Perhaps General Cummings can give us more in the way of details.

Mr. RILEY. Very frankly, the committee has been sold on the proposition of expanding the base and having it ready, rather than using critical materials to manufacture a lot of equipment that might become obsolete before you have need of it.

General FORD. Very definitely, sir.

Mr. RILEY. But we would like to know a little more about it.

General FORD. We would much rather have production of a going concern turning out ordnance material if we get into a war than we would to take care of a lot of stocks without having any production going on.

Mr. RILEY. I think you are wise in that.

General CUMMINGS. We have a total of the 1951 and 1952 programs not actually budgeted under Ordnance but which we have been working up projects against, of about $1,500,000,000. We have actually had projects approved to date for $1,086,000,000. These records indicate that we had another $150 million up for approval or en route to G–4. We now have additional projects in the order of $300 million being prepared which would take care of the entire $1.5 billion.

Mr. RILEY. Do you consider the projects that you are now proposing to spend this money for and for which you have already contracted absolutely essential?

General FORD. Yes, sir. I would like, if I may, to make a statement on that.

Mr. RILEY. We would be glad to have it.

General FORD. We are going at the job just as carefully and thoroughly as we can. That is one reason maybe why there has been, you might say, some delay in obligating this money for expanding the base. I would like to go back again to the Cadillac plant in Cleveland. We could have, when we gave them the order, bought all the equipment and put it in, based upon the information that we had at that time. We agreed with Cadillac that that would be an unwise thing to do, because we did not have the best information available at that time. As Cadillac has been in production for the past 6 months or so, they have gained a lot of information and a lot of engineering knowledge on the manufacturing operations so that very shortly we are going to be be able to come up with what we think will be the best possible production facilities to give us the most economical production as we see it, all with the idea of being able to do it with less capital investment in the form of equipment and less in the form of direct labor.

Mr. RILEY. With the exception, then, of certain ammunition facilities that you have, you are actually using most of the facilities that you contracted for on this production base, is that correct?

General FORD. Yes, sir.

Mr. RILEY. Actually in use?

General FORD. Yes, sir.

General CUMMINGS. We actually have many facilities, sir, in the tank field, in ammunition, and other lines, which we have contracted for or for which we have expedited production requests approved, but

which are not yet in being and are being brought into being through the medium of this expediting production set-up.

Mr. RILEY. Will they be used?

General CUMMINGS. They will be used under these very programs; yes, sir, current programs.

Mr. RILEY. They may not be used around the clock, but they would be used on the average regularly?

General CUMMINGS. Yes, sir.

Mr. RILEY. In connection with that, with reference to your present facilities, you say you do not have an adequate base. Are you running any overtime at present?

General CUMMINGS. Yes, sir.

Mr. RILEY. Would the expansion of your base eliminate some of that overtime?

General FORD. It will, sir.

(Off the record.)

RENEGOTIATION OF CONTRACTS AND PRICE REDETERMINATION

Mr. RILEY. At the bottom of page 3, with reference to these new items, you say that:

> Generally, these contracts provide for repricing after 40 percent of the items involved have been produced.

Is there any renegotiation on the cost of that 40 percent?

General FORD. There is always renegotiation of contracts after the contracts may be completed. This is what we call price redetermination, to get a firm price for the entire contract.

Mr. RILEY. That amounts to renegotiation on items that have already been completed, does it not?

General FORD. A certain percentage; yes, sir.

General REEDER. The renegotiation is a separate and an additional step.

Mr. RILEY. That is done after the entire contract has been completed?

General REEDER. Yes; if a firm had several contracts and had profited too much by doing business with the Government, the recovery is made in renegotiation. But on the individual item, particularly with new ones where experience is lacking, they are protected by a price redetermination which may be upward or downward but which, in our experience, has usually been downward.

Mr. RILEY. As I understand your statement, in the course of a contract on a new item, there is a redetermination at two periods of that run, if I may use that term?

General REEDER. There is one and, if necessary, another one.

Mr. RILEY. There is one at the end of 40 percent?

General FORD. And there may be an additional one.

Mr. RILEY. There may be?

General FORD. Yes, sir. This redetermination of price option may again be exercised after another production run has been attained.

Mr. RILEY. But that is not always actually done?

General FORD. No, sir. It may depend upon the length of the contract. If the contract extends over quite a period of time and the contract is of considerable volume, the contractor may be able to make

savings and it may be appropriate to redetermine the price again.

Mr. RILEY. I should imagine that the price would be higher on the first 40 percent than on the last 60 percent.

General FORD. Yes; the starting-up cost is high.

ORDNANCE WAREHOUSING

Mr. RILEY. Approximately what is the cost of warehousing the weapons and ammunition that you are now making that are being put in reserve? Do you have any figures on that?

General REEDER. We do not have any considerable reserve, so that we do not need any money for that at this time.

Mr. RILEY. Where are you keeping these surplus weapons?

General REEDER. We have not gotten the production yet. For example, I was citing the ammunition figures this morning. We have used far more of what we started with than what we have produced, so that there has not been anything of that kind to warehouse.

The other equipment such as that which we have already gotten has been issued to troops, so that as yet we have really nothing to warehouse that has come off the production as war reserve.

(Off the record.)

General REEDER. What we have done there is to substitute so that in effect we have made no change.

(Off the record.)

Mr. RILEY. May we assume from that that you have some unused storage facilities at the present time?

General FORD. We do in the field of ammunition. Some of our magazines are empty and I imagine will be empty maybe for some little time; but eventually we hope that they will be filled.

Mr. RILEY. But you do not need to build any more?

General FORD. A few magazines; yes, sir; as we attain an adequate stock.

General REEDER. In practice, since we deal a long time ahead, we are asking now for funds with which to build warehouses which we will need when we do get the reserve. But at the present time we are not spending anything on warehousing reserve because we have not gotten the production.

Mr. RILEY. Are you requesting anything?

General REEDER. Yes, sir.

Mr. RILEY. What are you going to do with warehousing if you do not need it?

General REEDER. By the time it is built we will; that is the point. In the 1953 construction appropriation you are really looking to the tail end of 1954 and the beginning of 1955.

EFFECT OF RESEARCH AND DEVELOPMENT ON ORDNANCE PROCUREMENT

Mr. RILEY. At the bottom of page 2 of your statement, General, you say:

> In addition to the high initial cost and the current maintenance costs, advantage could not be taken in all cases of improvements resulting from our current accelerated research and development program.

General FORD. That might take two forms. After a product is in production—a truck or a tank or a weapon—it is always possible to effect improvements and produce a better piece of equipment. In the

case of vehicles that happens almost every day, although on a small scale. There are certain improvements that come in in a rather small way, you might say. Now, there are other improvements that come in in a much larger way; that is, we may by research and development come up with an entirely new and better weapon which may replace a weapon which we have had in production.

Mr. RILEY. Then you would make changes?

General FORD. Yes, sir.

Mr. RILEY. But I understand from that statement that you are not able to take advantage of all the research and development especially in regard to small items; but if there is a major item, you will change your manufacturing procedure to take advantage of it, if you find that the item is economical to maintain, and so forth?

General FORD. Yes, sir. And that would depend very much upon the item and the nature of the item. There might be cases where we might say, let us stop making this particular item at this time and swing that contractor into a new item, which is not much different than the one he is making, but is enough different so we want the later version. That would be one example. Another example might be where we could come up with a better weapon that has proven itself by service test, so that we might close out a contract and bring in a new item on another contract.

Mr. RILEY. Of course, when you do that, you incorporate all the improvements that you have developed.

Generl FORD. Yes, sir.

FACTORS UNDERLYING THE ORDNANCE PROCUREMENT ESTIMATES

Mr. RILEY. On page 3 of your statement you say:

> The quantities of weapons requested in these estimates, which are based on firm troop requirements, are sufficient to maintain on a reduced basis the production facilities which are being established up to this time.

How do you arrive at your firm troop requirements?

General FORD. That comes to us, of course, in the form of a program and troop basis upon which our plans for procurement of equipment are based and that, as we saw this morning again, is tabulated and worked out on these forms 519. In other words, the General Staff decisions on the size and constitution of the Army provide for us a troop basis under which we then can calculate the amount of equipment needed to provide for that program.

Mr. RILEY. You do not provide any reserves in connection with your firm requirements?

General FORD. There are some reserves; yes, sir, even in the items of equipment. But it will vary, as General Reeder discussed this morning, depending upon many, many factors. An easy-to-get item, as we see it, would not call for as large a reserve as a very hard, difficult, long-lead-time, complicated item. So we are not able to say, as Mr. Scrivner brought out this morning, that our reserves are all balanced in all items of equipment at a certain level. We say they are not balanced that way because we do it on an individual basis considering the factors that I mentioned, such as hard-to-get, long-lead-time as against something that is more readily obtainable.

Mr. RILEY. Where you have more than your requirements in certain categories, as was brought out this morning, you stop the manufacture

of those items and concentrate on the ones you lack? Or do you keep on making some of those you do not need?

General FORD. No, sir. We have not reached that point by quite a long ways, sir. You may be referring to certain ammunition items which we discussed this morning. It was brought out this morning that we are shooting up a large amount of ammunition.

General REEDER. Mr. Chairman, I wonder if I might correct the record a bit?

Mr. RILEY. I will be glad to have you do that.

General REEDER. I believe what was brought out this morning was not that we had more than our requirements either funded or in possession, but that some of the requirements might have been overstated. We did not get down to the bottom of the form which showed the large unbudgeted residue. I did not want any inadvertence to be left in the record.

(Discussion off the record.)

POST-BUDGET PRICE INCREASES FOR ORDNANCE ITEMS

Mr. RILEY. Have the costs of production of the end items that you propose to acquire in 1953 increased above your estimates at the time this justification was made up?

General FORD. Mr. Chairman, as you know we do have to go on estimates unless we have good manufacturing cost information. We are getting almost daily more and more information on costs. On the other hand, it is a little difficult to be able to answer what the cost may be a year from now and the best we can do is to provide information essentially in the form of estimates based upon our very best information at the time.

Some costs may go up; we do not know. The cost of materials may go up. We do not know that. We do not know whether labor costs may go up.

On the other hand we hope and we even expect that with a larger volume of production that we are getting into here month after month, our prices will come down. But that has also been taken into consideration.

ORDNANCE COSTS FROM SPECIAL TOOLING

Mr. RILEY. Have your costs increased as the result of special tooling?

General FORD. The initial costs, the starting-up costs, the early production costs, are always high.

Mr. RILEY. I realize that. I think that is perfectly evident. But I am wondering whether the costs have been increasing because of special tooling or whether you are over the hump on that.

General FORD. We would hope that as manufacturers improve their processes and put in special tooling and as we may provide special machines, the costs would come down as a result thereof.

PROCUREMENT SLIPPAGES IN ORDNANCE ITEMS

Mr. RILEY. You speak here of slippages. What are some of the items in which that has shown up the most?

General FORD. That is covered pretty much across the board, possibly not so much in the field of tactical trucks. We have hit our

schedule pretty well there. In combat vehicles, we have had more difficulty getting into production. Those have been vehicles of new types, vehicles which we had not produced before, vehicles which by and large were not completely developed in all their aspects, without having complete development-type tests both at our proving grounds and on the part of our troops. That was something of a risk that we took a year ago in getting these items into production.

On the other hand, it would seem to be a worth-while risk because we had better types as a result of research and development. And we prefer to have those, in the modernization of our Army, in preference to building World War II types where we did have better information as far as production was concerned.

There has been problems of machine tools and problems of materials and many, many problems of getting into production on military items, along with the rather large commercial production for the civilian economy.

Mr. RILEY. Is your truck entirely an Ordnance product or can you use some of the parts and equipment that is used in the ordinary commercial truck, built by the better truck manufacturers?

General FORD. Are you speaking of our tactical truck, sir?

Mr. RILEY. Yes.

General FORD. Yes and no. Certain elements, such as the engine, the transmission, certain parts that go on the engine and other parts are, by and large, commercial items. On the other hand, our trucks have to stand a lot more rigorous use on the battlefield, so we generally make them more rugged. Also we drive, in our tactical trucks, on all axles, which differs from a commercial truck. So the axles would be different.

Mr. RILEY. But the engines by and large, are commercial items, with some few additions.

General FORD. Yes, sir. The additions may come into such form as having vehicles that will stand rough usage. We have another requirement that comes into our tactical vehicles, where we have to go a little farther than in the case of commercial vehicles. That is in the matter of electrical suppression for radio use on the battlefield.

COMPARISON OF PRICES OF MILITARY VS. COMMERCIAL TRUCKS

Mr. RILEY. Could you give me some comparison as to the price of a military truck as against a commercial truck of similar capacity? About what is the additional cost?

General FORD. I have an officer standing by, sir, who I am sure could give much better information on that than I can. The point concerning our tactical vehicle which is so important to us is that we have ruggednes, durability, and reliability in that vehicle, which will permit its use under very rigorous conditions in the combat zone. That is very important to us.

Colonel ENGLER. I think the question was to compare the cost of one of our tactical trucks with a commercial vehicle.

Mr. RILEY. Of similar load capacity.

Colonel ENGLER. Of like carrying capacity. The military tactical trucks of the cargo type would be the M–34, 2½ ton, without winch. It would have also to be without spare parts in order to compare it with the commercial vehicle. That particular truck is costing at the

present time $6,813. A comparable commercial vehicle would have to be in the 5-ton category, in view of the fact that our 2½-ton tactical truck is designed to carry a 5-ton payload on highways, and the commercial vehicle is built for a similar carrying capacity on good highways. The commercial 5-ton truck in the cargo type costs in the neighborhood of $5,271. That commercial vehicle has only one driving axle.

Mr. RILEY. On that commercial truck is that a 5-ton truck or a 2½-ton truck that you quoted the price on?

Colonel ENGLER. The commercial truck I quoted was the 5-ton truck.

Mr. SCRIVNER. You missed the point. I think probably the mistake Ordnance has made in times past is in not pointing out what the colonel just pointed out. Now, when you talk about a 5-ton truck, a tactical vehicle, you never in the past made it clear to members of this committee, and I never really appreciated it until I went up to Detroit arsenal, that when you are talking about a 5-ton tactical vehicle you are talking about a vehicle that will carry 5 tons over any type of terrain that you are apt to meet up with in combat, whereas normally, when we are speaking of 5-ton trucks we are thinking of the 5-ton trucks we see out on the highway here.

General FORD. That is very true.

Mr. SCRIVNER. So actually your specifications are practically double the specifications of a normal truck as we think about it. In other words the 5-ton truck will carry 10 tons on highways. That is the big difference in the whole works.

Mr. RILEY. The public does not understand that either.

Mr. SCRIVNER. No, and it has not been made clear to this committee before, and I am glad he mentioned that because I was going to ask him that. It is very important.

General FORD. I think comparative costs come in also because with our 2½-ton truck we have three axles and we drive on all three of them. We drive on six wheels, and as Colonel Engler points out, the commercial truck does not have to do any more than drive on their rear axle to do their job. We want the truck to be able to go through the mud and get to a battery on the battlefield with a load of supplies.

Mr. SCRIVNER. And I want to point out again so it will be thoroughly clear in the record, that when you talk about a 2½-ton truck in your tactical vehicles, that 2½-ton truck will carry a 5-ton load as carried by one of the normal civilian vehicles.

General FORD. Yes, sir.

Mr. SCRIVNER. In other words, your rated weight carrying capacity is in most instances almost half of what we refer to when we are talking about a similar weight truck. The tactical truck will carry twice as much.

General FORD. Yes, sir.

General REEDER. In other words, this tactical truck in its rated capacity will really carry twice or maybe more than twice what a commercial truck will under similar conditions.

General FORD. That is right.

VEHICLE TAXES PAID BY THE GOVERNMENT

Mr. SCRIVNER. While we are on that, let me ask you one thing. When you were comparing prices, was that your net price or does it include tax on both vehicles?

Colonel ENGLER. That includes the tax on both vehicles, sir.

Mr. SCRIVNER. What I want to bring out there, Mr. Chairman, is that it is one of these anomolous situations that seems so completely whacky. This is another thing that has never been made clear to the committee. When we buy one of these vehicles, even though it is for combat use, we are paying the same motor vehicle tax that the civilian truck buyer is paying.

Mr. RILEY. I did not know that until now.

General FORD. And also with the spare parts we buy for the vehicle.

Mr. SCRIVNER. The battery, and the whole thing. We finally did in this committee get a deal worked out where we did not have to put up with that in our fuels, but it seems so absurd and silly to spend all that money on manpower, and everything else, on figuring the taxes collecting and remitting it into the Treasury, and then at the same time appropriating our public funds and have to carry it all the way back through in an amount necessary to pay the tax on these very vehicles. This tax will run into many millions of dollars, if I am not mistaken. Someone is going to get the figures on that. If not exact, then approximate figures.

General REEDER. $100,000,000 will not be too far off.

Mr. SCRIVNER. We are supposed to get the figures of the cost of the taxes that are incorporated in the figures given us.

Mr. RILEY. That is another thing the average layman and average taxpayer does not know. It seems to me a great deal of money would go for handling and administration, and the Government really does not get much benefit from these taxes.

Mr. SCRIVNER. Surely. Every dollar of taxes you collect cost some money.

Mr. RILEY. Handling it costs money.

Mr. SCRIVNER. This tax matter arose when I made this trip up to Detroit Arsenal. We had just previous to that been talking about the price of jeeps, and when we got to discussing jeeps up there they gave me a figure that was considerably lower than the lowest figure given the committee. I immediately asked why that was their price. If they quoted to me that price why were we quoted such a greater price before the committee. They pointed out then that there were no taxes on the price they quoted and that was one of the big items in it.

COMPARISON OF PRICES OF ARMY JEEP VERSUS COMMERCIAL JEEP

Mr. RILEY. I wonder if Colonel Engler could give us a comparison between the commercial jeep and the Army jeep.

Colonel ENGLER. Yes, sir.

Mr. RILEY. With comparable equipment.

Colonel ENGLER. The military jeep without spare parts and without winch, since we are buying our jeeps without winch, will cost $1,988 with economy measures now being effected, as compared to a commercial jeep price to the Army of $1,303. Those are not the same vehicles.

Mr. RILEY. You have a heavier construction, do you not, plus a much better wiring system?

Colonel ENGLER. Yes, sir. We use the 24-volt electrical system in our vehicle, as compared to the commercial 6-volt electrical system. That 24-volt system is required in order to operate from that vehicle the communications systems they are now using with a jeep. Also,

our jeep possesses certain waterproofing characteristics and certain suppression characteristics that are not required on commercial vehicles. The vehicle in general is a heavier, sturdier vehicle all the way through insofar as design is concerned.

WATERPROOFING OF VEHICLES

Mr. SCRIVNER. Let us go back to your waterproofing. I thought I was told that instead of waterproofing them now at the outset, they were being furnished with waterproofing kits. That was to reduce the price considerably.

Colonel ENGLER. Sir, we are reducing the very strict waterproofing specifications that we had to a specification that you might term more in the order of a splash-proofing specification in order that when that vehicle fords streams or goes through certain normal operations whereby it would be faced with having water in the engine compartment, you would not drown the vehicle out. But the vehicle specifications are being reduced so that the vehicle in itself will not have the capability of actually making a landing operation where all but the driver is submerged under water. In order to do that it is now necessary to apply a kit. So, although we have reduced the specifications, there is still some requirement for water protection in order to avoid drowning the engine out.

Mr. SCRIVNER. How much does that reduce the price?

Colonel ENGLER. The over-all of various measures that we are now taking, and the process which we feel is right at hand and can actually be on the vehicle, we are estimating at an over-all reduction in cost of $125. Beyond that there are many other things being done which will further reduce the cost, but at the present time we are only taking advantage of those things which we see can immediately be changed in the vehicle, and there are certain other things which must undergo tests and which must undergo analysis by the field forces, particularly where military characteristics may be affected.

Optimistically we would hope to get in the neighborhood of $200 to $250 when we are all through. I do not know whether all those changes will pan out.

Mr. SCRIVNER. When you figure the number of jeeps you buy, $250 of saving on each one is going to take care of a lot of the pay of Army personnel, or something else. There was some discussion, and I do not know whether it got past the discussion stage or not, in relation to your radio suppression. Inasmuch as that does not figure in a great many of the jeeps you procure, in other words, they are not operating in places where radio suppression is very important, there was some discussion as to whether it was needed. What has been developed on that?

RADIO SUPPRESSION IN MILITARY VEHICLES

Colonel ENGLER. The thinking still is that all of the vehicles will require the radio suppression, because no matter whether that particular vehicle has a communications set on it or not, all of the vehicles operating in the neighborhood of either communications equipment or other electronic devices will have to be suppressed in order to avoid giving undue interference to the equipment in the neighbor-

hood. So it is not just a question of what you have mounted on that vehicle, but whether that vehicle itself will operate in the neighborhood of such devices. As far as I know now, sir, the thinking still is that they must all be suppressed to a standard characteristic.

PAYMENT OF TAXES ON PURCHASE OF VEHICLES

Mr. SCRIVNER. Going back, if I may, Mr. Chairman, to one point we were discussing, that is, the matter of taxes Uncle Sam has to pay to Uncle Sam on military vehicles, a rough estimate has been made. Inasmuch as in fiscal 1951 and 1952 a request was made for $2,000,000,000 worth of all noncombat vehicles, therefore a 5 percent tax on that is just $100,000,000.

General FORD. The tax is now 8 percent.

Mr. SCRIVNER. Can somebody give us what it might be at this place in the record?

General FORD. You recall in our hearings a year ago, Mr. Mahon asked for that, and we put a statement in the record. We can bring that up to date. This applies not only, of course, to the Army, but the Navy and Air Forces, because we buy the vehicles for them and the same tax applies. It makes it particularly hard, it seems to me, Mr. Scrivner, for the small-business man who may be delivering to us fairly small quantities of spare parts for vehicles, and we buy spare parts all over, and many times from small business concerns, and they have to figure the tax.

(Discussion off the record.)

Mr. SCRIVNER. Mr. Chairman, I have just been informed that there has been a presentation earlier to the full committee which covers the matter of taxes. Therefore I will withdraw the request I have just made for this information.

Mr. RILEY. All right. Do you have any more questions in respect to these trucks?

Mr. SCRIVNER. Not now. I am going to ask some after a while.

PERCENTAGE OF ORDNANCE ITEMS TO BE PROCURED IN 1953 ON A FIRM-PRICE AND ESTIMATED-PRICE BASIS

Mr. RILEY. I have just one or two questions. General, can you give me an estimate of the percentage of items that you are going to acquire in 1953 and on which you have firm prices?

General FORD. Well, those items, Mr. Chairman, where we have a contract, and most of these items are under contract at the present time, we have a so-called firm price. That is the contract price as it may exist with the contract in being. However, with the price redetermination we expect that there will be a different price before the contract is completed. I am not sure that that answers your question very well.

Mr. RILEY. No. I am wondering if you could give me an estimate on the contracts where you have a firm price on these end items that you propose to procure in 1953 with the appropriation now under consideration.

General FORD. Yes, sir.

Mr. RILEY. And the proportion on an estimated price. In other words, your new items that go in, on which you estimated.

General FORD. We have the estimated price in the secret supplement. If you do not have a copy of that we can make that available.

Mr. RILEY. On a percentage basis.

General REEDER. I wonder if we could not get that for the record by going through the items listed in the budget and weeding out those which are extensions of contracts and those which are new procurement for which a price has not been set.

General CUMMINGS. Even in that case, as General Ford pointed out, that will be a contract price as of today, but it is not necessarily a firm price for this budget purpose. It is still in the nature of an estimate.

Mr. RILEY. It would more than likely be a maximum price.

General CUMMINGS. We would so hope. Yes, sir. In most of our contracts we have two prices basically. One is a rather high unit cost for the first 40 percent, which absorbs the starting-up load, and then what we call a run-out price for the remaining 60 percent, which is normally less than the average for the entire contract. The latter price is the one we normally use in our budget estimate, that is, the run-out price.

Mr. RILEY. The run-out price is the last 60 percent of the run?

General CUMMINGS. The farthest price in the future that we can forecast now. Yes, sir.

Mr. RILEY. I think it certainly worked out to be the maximum price because you have offsets both ways in your contracts as a whole. So I doubt that your firm prices would run as a whole more than the price which you had arrived at.

General REEDER. I would not be too sure of that. Take the steel business today. Let us suppose a contractor in the original contract estimated very close so that he did not require much price determination. When this Wage Stabilization Board raises steel wages, the price of steel will rise, and our prices go up.

Mr. RILEY. If they raise them a certain percentage it would not be hard to add that to it.

General REEDER. No, sir, but it is possible for that not to be the maximum price.

Mr. RILEY. Could you give me an estimate on the percentage of firm prices and then correct the record?

General REEDER. For the entire appropriation?

General CUMMINGS. I would say 70 percent of the items are based upon contractual prices.

Mr. RILEY. When you estimate prices on new end items how do you arrive at that price? Through what procedure?

General CUMMINGS. If you take an item such as ammunition, we have very similar types of ammunition with either actual production experience or contract cost experience to date, and we translate that into the new item. In the combat vehicles it is based on a similar comparison with a vehicle of the same general type in which we have experience on the cost of the principal components, and the cost of fabricating the particular structure.

Mr. RILEY. It is based on actual experience, then?

General CUMMINGS. Our experience on similar or related equipment.

Mr. RILEY. Yes. That is the answer I want to get, Mr. Scrivner.

EXAMPLES OF ORDNANCE PROCUREMENT ITEMS

Mr. SCRIVNER. As you look through these various pages of justifications we run into two outstanding features: One is some of the items have a high individual cost which makes the total figures soar up into the millions. The other is that while the individual unit cost is small, the number of items to be procured is large, which again runs the request into millions of dollars.

While there might be some questions about many items I might like to ask you about, I am going to try to confine my request for information to those which are either in class 1, that is, high in unit cost; or class 2, high in the number of units. I want to preface my other questions first by asking how the net procurement requirement was arrived at. Was it by the use of a process similar to 519?

General REEDER. Yes, sir. In every case. Ninety-six percent of the money value of this original request has been covered by 519.

Mr. SCRIVNER. Some of these questions I ask will undoubtedly require answering off the record. Whenever that is true indicate it and we will go off the record and get the answer.

The first item I would like to discuss is the 105-millimeter howitzer. As I read it, it is model 2A1, with carriage. I cannot interpret the rest of it. What is the rest of it?

General REEDER. With carriage, howitzer, 105 millimeter, M2A2. In other words, there is covered on this particular sheet both items—the earlier model and the second model.

General CUMMINGS. No, sir. That is the completed carriage with the howitzer itself and equipment.

General REEDER. Is that the carriage?

General CUMMINGS. Yes.

General REEDER. I thought you had two howitzers. Do you not have an M–1?

General CUMMINGS. It could be called perhaps "Howitzer carriage complete."

Mr. SCRIVNER. What does that WE mean?

General CUMMINGS. With equipment and without concurrent spare parts.

Mr. SCRIVNER. Let us go off the record for a minute.

(Discussion off the record.)

FURTHER EXPLANATION OF THE MEANING OF COMBAT CONSUMPTION

Mr. SCRIVNER. In answer to a question that I asked off the record it was now brought to our attention that when we are discussing requirements, when we use the phrase combat consumption that does not in all instances carry the ordinary meaning of expenditure in combat as we usually think of it, but also includes the numbers of items which have been transferrred by the United States to other nations' units in Korea using that same equipment. Is that right?

General REEDER. That is correct.

Mr. SCRIVNER. So that in figuring these things we have to take into consideration that one fact, that there is the actual loss in combat or use in combat plus the transfer of these various items to other nations' organizaaions with us, such as the Greeks, English, and Canadians, or whoever it might be using the same equipment.

General REEDER. Particularly the Army of the Republic of Korea.

Mr. SCRIVNER. Which is getting supplies from the Army of the Republic of the United States.

General REEDER. Yes.

Mr. SCRIVNER. Off the record.

(Discussion off the record.)

ASSUMPTIONS UNDERLYING COMBAT CONSUMPTION ESTIMATES

Mr. SCRIVNER. As I understand the procedure followed, the combat consumption, as we have previously outlined it, is based on actual figures. Is that right, General Reeder?

General REEDER. For fiscal 1951.

Mr. SCRIVNER. 1951.

General REEDER. That is right.

Mr. SCRIVNER. And the estimates for fiscal 1952 were projected largely on the assumption that the character of the combat in 1952 would be pretty much along the same line as in 1951.

General REEDER. Yes.

Mr. SCRIVNER. And were made prior to any considerable headway in the so-called peace talks. Is that correct?

General REEDER. Yes, sir.

Mr. SCRIVNER. Off the record.

(Discussion off the record.)

MONDAY, MARCH 10, 1952.

Mr. RILEY. Mr. Scrivner has the witness.

WEAPONS

Mr. SCRIVNER. Much of this succeeding discussion, Mr. Chairman, probably will have to be off the record, inasmuch as it will relate to exact numbers and types of weapons and matériel; but I would like to have as much of it as we can on the record so that the remainder of the committee and the House will have some benefit. I am sure all of us realize the caution which we should take in considering this particular problem.

(Discussion off the record.)

Mr. SCRIVNER. General, give us as much information as you can on the antiaircraft mount T–83E1.

(Discussion off the record.)

Mr. SCRIVNER. How many Browning machine guns did you have at the end of World War II?

General REEDER. We will have to supply that.

(The information requested was furnished for the committee files.)

Mr. SCRIVNER. Well here is an item that is an old standard item and, as nearly as I can recollect it, no funds were requested for them in 1951 and 1952 and now we are faced with a request for nearly 4,500 of them in 1953?

General REEDER. That is right; because as time goes on, they are used up in Korea and so forth, and there comes a time when we have to resume manufacture.

Mr. SCRIVNER. The strange thing is that here is an old standard weapon and no significant changes, as yet, have been called to our attention.

General CUMMINGS. Yes; Colonel McCulla could outline some significant changes in that.

(Discussion off the record.)

EFFECT OF CALIBER CHANGES ON AMMUNITION USE

Mr. SCRIVNER. While we are on this subject of machine guns, .30 caliber, will it be possible to modify those weapons to take care of the ammunition that would be used in case we adopt the new light .30-caliber rifle?

General REEDER. They may be manufactured in that way. We have a study going on on ordnance right now to find out how to introduce this light ammunition, if it is going to be used, without wasting what we have.

Mr. SCRIVNER. Well, here we go again. I can recall and probably you can, too, the trouble we have always had. It is not anything new. I can recall in World War I when the rifle company would have various types of ammunition. I have forgotten how many, but we were using the British Enfield ammunition, we were using the French Chou-chou rifle ammunition; we were using some .30-caliber United States ammunition; we were using some United States .30 machine-gun ammunition. My recollection is at one time we had to have either 14 or 15 types of small-arms ammunition coming into a rifle company. And of course if they picked up the wrong box and it got up to where the men needed it, you might just as well have sent them a box of rocks. And you are getting into the same ammunition supply problem now.

General REEDER. That problem has been facing us.

Mr. SCRIVNER. How much has it really been stressed?

General REEDER. That is the point in this study that is going on.

Mr. SCRIVNER. And it is not yet completed?

General REEDER. No, sir. We of course have considerable stocks of the old caliber .30. We certainly are not going to throw those away or rework them; therefore the problem is, if we adopt the new lighter ammunition, how do we work it in with no waste of our present stocks?

Mr. SCRIVNER. Of course when you get in a pinch and really need it, cost does not play as important a part as having the right stuff there when you need it.

General REEDER. But now we have the time to look and we are doing that.

Mr. SCRIVNER. Have you been able to find the information as to the number of those Browning machine guns we had on hand at the end of World War II?

Mr. SCHULMAN. No, sir; I do not have that data with me.

Mr. SCRIVNER. Bring the information down to date when you supply that.

General REEDER. I doubt whether that can be done. You mean to make it chronological?

Mr. SCRIVNER. Yes. Somebody somewhere ought to be able to tell us the story. You had to have something to go on, on which you based your inventory of June 30, 1951?

General REEDER. I do not believe you can get a chronological record on that from those produced in World War II.

Mr. SCRIVNER. Somebody ought to be able to give us a pretty good idea of how many we had at the end of World War II.

General REEDER. We can tell you how many were produced; but there were an awful lot which fell into the category of this unclassified property which was worked over.

Mr. SCRIVNER. If it was worked over, it was brought back into inventory?

General REEDER. That is right; but there is that period in there when I do not think you can get a consecutive story.

Mr. SCRIVNER. Give us the best you can; but, of course, that is not satisfactory.

Mr. SCHULMAN. We can give you the inventory of the weapons as of January 1 of this year.

Mr. SCRIVNER. That does not give the entire picture. Eventually that is what you will come to, I assume?

Mr. SCHULMAN. No; January 1 is the actual inventory. We will furnish the best information we can on this machine gun.

COLT .38 WITH 2-INCH BARREL

Mr. SCRIVNER. Now here is an item that has caused me a great deal of curiosity on page 105—"Revolver, Colt, caliber .38, 2-inch barrel." You say the net procurement requirement will be 15,983 and out of this appropriation you are requesting 9,400, or a little more than one-half of them?

General REEDER. That is a special job.

Mr. SCHULMAN. That is for our military police organizations and for CIC and CID.

Mr. SCRIVNER. There we go again with another ammunition requirement. Why cannot the military police still use the .45?

Mr. SCHULMAN. The function of this particular weapon with a 2-inch barrel is for use when the operator is working in plain clothes, and it is rather difficult to conceal a caliber .45 on your person.

General REEDER. This is equivalent to the Derringer; about the same thing.

Mr. SCRIVNER. You had better give us same detailed information on Form 519 to justify 15,000 of them.

(Discussion off the record.)

TANK, T–41

Mr. SCRIVNER. Now, General Reeder, going into the item of the 76-millimeter tank, T–41, what was your combat consumption in 1951 and what do you anticipate in 1952?

(Discussion off the record.)

Mr. SCRIVNER. What do your actual figures show for Korea?

(Discussion off the record.)

WEAPONS FOR USER TEST

Mr. SCRIVNER. On page 107 you set out a list of weapons for user test. Since some of those seem to be new weapons or at least improvements on some of the older ones, it would be better to have a discussion of those off the record. Of course, many of these user test weapons are practically hand-made, so that the cost shown here is much greater than what it will be when you get into production?

General CUMMINGS. That is correct.

(Discussion off the record.)

Mr. SCRIVNER. What is the difference between your first tank item and the last one?

(Discussion off the record.)

T–50 RECOVERY VEHICLE

Mr. SCRIVNER. Tell us something about the recovery vehicle, T–50.

Colonel ENGLER. In the recovery-vehicle class we have at the present time two vehicles in the picture—a light recovery vehicle and a heavy recovery vehicle. The light recovery vehicle is for the purpose of having light armor protection in order to effect actual recovery under battlefield conditions.

Mr. SCRIVNER. Recover what?

Colonel ENGLER. Either armored or track-laying vehicles. The light vehicle will take care of anything below the medium-tank class. In other words, the purpose is to recover light gun tanks and various tank tractors and self-propelled artillery that come within that weight classification. The heavy recovery vehicle is for the purpose of battlefield recovery of medium and heavy tanks and vehicles of that weight classification.

Mr. SCRIVNER. Tell us something about its operation? You get out on the field and recover a tank, then what happens?

Colonel ENGLER. It is for the purpose of going out on the battlefield itself either during a lull in operations, or actually over ground of which we now hold possession but is still subjected to enemy fire, picking up a vehicle that is disabled and bringing it back in order that it can be repaired.

Mr. SCRIVNER. How many men in the crew?

Colonel ENGLER. Four men. And it is so set up, so designed, that it can actually attach itself to the disabled vehicle without the crew exposing themselves. In other words, it can latch on to the front or rear of a tank or a piece of self-propelled artillery that has been disabled and either lift a portion of it or tie on to it without the crew actually having to get out and moving around the tank and attaching it.

Mr. SCRIVNER. That is a considerable improvement over the old method—with less hazard to the crew.

Colonel ENGLER. It is.

Mr. SCRIVNER. Is this a result of suggestions made by this noncom, or warrant officer, up at the arsenal that we were discussing a while back?

Colonel ENGLER. Yes, sir. The design was considered of this noncom and also Aberdeen had been working on means and methods of doing this.

Mr. SCRIVNER. My recollection is that this noncom was at Aberdeen.

Colonel ENGLER. He may have been. I know Aberdeen was very active in that.

Mr. SCRIVNER. Substantially, it boils itself down into a tank recovering tank?

Colonel ENGLER. That is correct; except it does not have——

Mr. SCRIVNER. It does not have the weapons or anything else that a tank would have?

Colonel ENGLER. No, sir.

Mr. SCRIVNER. How do you base your requirements on that? This is a special item?

General REEDER. That was really worked out by the field forces who stated the number they felt were necessary per tank in action, and it is just the best guess we can make.

Mr. SCRIVNER. But if they make an overestimate, which they usually do—they are never going to underestimate their needs; at least I have never seen any yet; they always have a margin of error in their favor—when you are going into an item costing a quarter of a million dollars as we have here, one of costing almost a quarter of a million dollars and the other one not as much, you had better give us the Form 519 figures on those.

General REEDER. We will furnish that.

(The information requested was furnished for the committee files.)

T–39 VEHICLE

Mr. SCRIVNER. What is the T–39?

Colonel ENGLER. That is a vehicle designed for use by the Corps of Engineers in demolition work, destroying enemy pillboxes, removing obstructions, and generally clearing the field for operation by armored units.

(Discussion off the record.)

Mr. SCRIVNER. Let us have the Form 519 on that.

Colonel ENGLER. Yes, sir.

(The information requested was furnished for the committee files.)

DIFFERENCE IN T–4 AND T–6 RECOVERY VEHICLES

Mr. SCRIVNER. Now what is the difference between your T–4 recovery and T–6 recovery?

Colonel ENGLER. The difference between the two is in the boom-carrying capacity of the two vehicles. The T–4 is a lighter-type recovery. It is a track-laying vehicle based on the light-tank chassis and is designed for general wrecking operations—wrecking operations of vehicles in the lighter-weight category. I would say that includes trucks as well as tanks up to the medium-tank class. It differs from the recovery vehicle in that it carries larger booms for wrecking operations, for lifting and removing obstructions.

Mr. SCRIVNER. In other words, it is somewhat similar in military parlance to the civilian tow truck in its operations?

Colonel ENGLER. Yes, sir.

Mr. SCRIVNER. Except it is given military features in application, and it is different from the other where you anticipate you have to pull a vehicle off the field by sheer power?

Colonel ENGLER. Yes, sir; and also is of great value in artillery units in that it is used in separate artillery units and in servicing artillery by being able to service a gun and moving artillery around.

Mr. SCRIVNER. The T–6 is much the same, except it is applied to the heavier vehicle?

Colonel ENGLER. That is correct.

Mr. SCRIVNER. Now we come down to the T–166. Tell us about that.

(Discussion off the record.)

T–18 VEHICLE

Mr. SCRIVNER. In one of the statements by one of the witnesses it was indicated they thought that the price of the T–18 for which there are no funds in this request although it is still under procurement from prior-year funds, could be reduced to at least $75,000. The present price is more than twice that much. If that is true, then logic would say that, as far as the taxpayer is concerned, procurement of the higher priced vehicle should be curtailed. And by "curtailed" I mean absolutely cut off until such time as you can get your lines working on the lower price vehicle. Have you a large number on hand?

General REEDER. No, sir.

Mr. SCRIVNER. Or on order, and they are coming off right now?

General REEDER. It is beginning.

Mr. SCRIVNER. They were coming off in pretty good size numbers the last I heard.

General CUMMINGS. They have not been delivered.

(Discussion off the record.)

Mr. SCRIVNER. The figures which you give now as to the present procurement price of the T–18 are considerably lower than the estimate given us for the 1952 hearings. I recall, during those hearings, when I made an inquiry of someone from Ordnance if they would be interested in receiving some idea that would reduce considerably the price, that I did not receive any request from Ordnance to furnish them that information. Apparently they found it themselves.

General REEDER. Yes, sir. We were in very close touch with Food Machinery who had the ideas and they came up with an estimate which they worked out. The estimate was considerably higher than their horseback estimate.

Colonel ENGLER. Both of the manufacturers have been working diligently trying to simplify the vehicle and cut down wherever they possibly could. Both engineering staffs have been working very hard and every time a suggestion for change was made that would not seriously affect the military characteristics of the vehicle, it was accepted in an effort to get that price through on that particular vehicle.

Mr. SCRIVNER. According to your last year's justifications, you desired to procure 4,487 at a cost of $172,618, which brought the request up to $774,536,966.

What was the quantity in your initial order?

Colonel ENGLER. The run-out quantity of the initial order—that was the last contract—it was reduced in estimate——

Mr. SCRIVNER. How many were involved?

(Discussion off the record.)

Colonel ENGLER. That is right.

Mr. SCRIVNER. What was the cost of that order?

Colonel ENGLER. I will have have to find the break-out cost, because it was echeloned down for the first quantity, and then it was reduced down as it moved along.

Mr. SCRIVNER. Can you give it to us approximately?

Colonel ENGLER. The average price for the whole contract was $105,000, without spare parts.

Mr. SCRIVNER. Did the $172,000 estimate given us last year include spare parts?

Colonel ENGLER. It did; that is correct, sir. The last estimate on the first 1,000 vehicles—I will have to break it down, because I am talking now about one contractor——

(Discussion off the record.)

Colonel ENGLER. At a going-out price of the first order, the $74,000 that I gave you.

Mr. SCRIVNER. Now, what was the total figure on that—about $48 million?

General REEDER. Between $48 million and $49 million.

Mr. SCRIVNER. What other orders have you placed?

(Off the record.)

Colonel ENGLER. We do not as yet have a definitive contract on that initial order with Food Machinery, but it indicates that our net price will be in approximately the same range as that with International Harvester.

(Discussion off the record.)

Mr. SCRIVNER. That would come to $110 million—is that pretty close to the figure?

Colonel ENGLER. Approximately $131 million. I would like to point out that we are now talking about the contract price for the basic vehicle. To that we have to add a certain amount of OVM which is required.

Mr. SCRIVNER. What is OVM?

Colonel ENGLER. On-vehicle material. Also to that must be added the spare parts required and the administrative cost which we add in order to establish a budget price.

Mr. SCRIVNER. What would be the figure for the on-vehicle material and the spare parts, per vehicle average?

Colonel ENGLER. The on-vehicle material is $1,900 for fire control——

Mr. SCRIVNER. What is the total?

Colonel ENGLER. The total is $1,734.

Mr. SCRIVNER. What about spare parts?

Colonel ENGLER. I would like to correct the record. That figure should be $2,734 instead of $1,734.

The spare parts are $31,603 per vehicle.

Mr. SCRIVNER. So that we have a figure of about $33,000 per vehicle in addition?

General REEDER. It comes to about $34,000.

Colonel ENGLER. Yes, sir. With the new $74,000 basic price, allowing for the spare parts and the overhead and the on-vehicle material that goes with the vehicle, the budget price for additional vehicles would be approximately $110,000 per vehicle. Any additional vehicles budgeted for in that category would be in that range of $110,000.

Mr. SCRIVNER. What is the added administrative cost?

Colonel ENGLER. The administrative cost is 6 percent, which includes transportation.

Mr. SCRIVNER. To what point?

Colonel ENGLER. To the first destination; transportation of the vehicle to the first destination.

Mr. SCRIVNER. Can you give me the total figure now?

(Discussion off the record.)

Mr. SCRIVNER. That means that about $430 million of the request made last year is not to be used for this purpose. What happens to the $430 million?

General REEDER. We did not get the request last year, sir.

Mr. SCRIVNER. How much money did you get last year?

General REEDER. That is where all the reductions were taken. The House made one reduction and the Senate made a further reduction.

Mr. SCRIVNER. How much did you finally come out with?

General REEDER. We came out with enough to buy these.

We had a little bit more—we had enough to buy these test models of the cheaper ones from Food Machinery and International Harvester.

Mr. SCRIVNER. That does not give me the answer. How much did you get for this program last year?

General REEDER. $240 million.

Mr. SCRIVNER. If you got only $240 million, how can you spend $350 million?

(Off the record.)

Mr. SCRIVNER. That is fiscal year 1951?

General REEDER. That is right.

Mr. SCRIVNER. Produced how many?

General REEDER. Those first contracts with Food Machinery and with International Harvester were made with 1951 money.

Mr. SCRIVNER. How much did you get in 1952 for this program?

General REEDER. $240 million.

Mr. SCRIVNER. How much did those purchased out of 1951 funds cost?

General REEDER. You would have to take the original contract price, because anything left out of that would revert to the Treasury, I believe, under the terms of the contract. What was the total contract price on those two, Colonel?

(Off the record.)

Mr. SCRIVNER. If you had the $183 million, where did you get the $243 million?

Mr. SCHULMAN. That is the amount of money that remained in this project out of the $774 million originally requested.

Mr. SCRIVNER. Some place, somewhere, your figures do not jibe according to my recollection.

(Off the record.)

General REEDER. That is wrong, very definitely wrong.

Mr. SCRIVNER. Was that in just one program and a supplemental, or something like that?

(Discussion off the record.)

Mr. SCRIVNER. That is where you get the total for the fiscal year '51?

Colonel ENGLER. That is correct, sir.

Mr. SCRIVNER. Out of the two supplemental requests?

Colonel ENGLER. That is right, sir.

Mr. SCRIVNER. That is all I have on this group, Mr. Chairman.

General REEDER. If I may, sir, answering some of your last questions here, I have here a breakdown that you requested for the 105 Howitzer, which I would like to caution you is a secret. We are not answering that for the record but furnishing it to the committee.

Also in answer to I believe a joint question of Mr. Flood and yourself, Mr. Scrivner, as to the expediting production funds, we have here a list of the projects and the amount obligated to date; the amount allocated to the projects, the projects under consideration and all stages of the business, totaling up somewhat more than the $1.7 billion. That, again, I would suggest not be put in the record.

Mr. SCRIVNER. That should not be in the record. But it should be available for the committee and its staff.

General REEDER. That was in answer to Mr. Flood's question before leaving on Friday noon on expediting production. But the way he asked it apparently it should be answered for the record, but I believe it would be desirable not to have it in the record, because there are some classified projects in there.

Mr. RILEY. It will be available here for the members of the committee?

General REEDER. Yes, sir.

NONCOMBAT VEHICLES

Mr. RILEY. What is your next category, General?

General REEDER. Noncombat vehicles—trucks, in other words.

Mr. RILEY. Do you have a statement on that?

General REEDER. I would like to make a very brief statement, sir.

Mr. RILEY. Proceed.

General REEDER. Mr. Chairman and gentlemen, program 1200, noncombat vehicles, is the first multi-sirvice program within the "Procurement and production" appropriation. In this program, funds are requested for procurement of general purpose and special purpose vehicles; these are not considered combat types, because their prime purpose is transport though some of them are used both in advance areas and in support of combat troops. Almost 90 percent of the funds in this program for this year's request are for the four principal types of Army Ordnance vehicles, the jeep, ¾-ton trucks, 2½-ton trucks, and 5-ton trucks. The balance of the funds requested is for those special purpose vehicles which are peculiar to the mission of our other Technical Services, such as Quartermaster Bakery trucks, Signal Service trucks, Engineer Bridging trucks and the like.

This appears to be the proper time to explain the Army's procedure with regard to purchasing of trucks. Our Technical Services are assigned budget, funding, and supply responsibility for trucks in accordance with the mission that service performs within the Army. For example, the Chief Signal officer determines the number of Signal Construction companies which are required to support an Army corps or Army group. In turn, he determines the number of Signal Service trucks required by those companies, funds for the trucks and insures that his units get their equipment; but he does not purchase the truck. The Signal Corps transmits his requirements for the Service Truck to the Chief of Ordnance, who, similarly, obtains requirements from other technical services for their mission-type trucks. The Chief of Ordnance is the sole purchasing agent for the Army for the truck chassis for these vehicles, eliminating any possible intra-departmental competition which would affect prices. It might be well to point out here, that the Chief of Ordnance is also the sole purchasing agent for these vehicles for the entire Department of Defense.

In this year's program, we are not requesting any funds for procurement of commercial-type vehicles. No war-reserve procurement is planned for commercial-type vehicles.

One last point, procurement of Ordnance vehicles, as planned with these funds, is absolutely essential in order to maintain the production base established with fiscal year 1951 and 1952 funds. We have more than generously attributed a large portion of the requirement to sustain this base to an anticipated fiscal year 1953 MDAP procurement program and accordingly reduced our request. Though some of these vehicles will be a part of our war reserve, they will constitute only a small portion of what is needed in the event of an emergency and represent just another step toward our desired mobilization readiness.

Mr. RILEY. These vehicles are all especially designed for Army use?

General REEDER. Yes, sir.

Mr. RILEY. They are heavier types than the ordinary commercial vehicles?

General REEDER. These are all different from comercial vehicles in their ability to go across country and to drive on all axles.

LEAD TIME ON VEHICLES

Mr. RILEY. What is the lead time on the four types of vehicles that you have listed here?

General CUMMINGS. 9 months.

Mr. RILEY. On all of them?

General CUMMINGS. On the four types; yes, sir.

Mr. RILEY. The same lead time on each?

General CUMMINGS. Yes, sir.

Colonel ENGLER. That is for a repeat order, sir.

General REEDER. Yes, that is for an order on a line in existence. Actually—I think it is very interesting to look back, starting up from scratch—when did you order the first jeeps and when did you get one?

Colonel ENGLER. We ordered the first jeeps in June of 1949. That initial contract called for the engineering to be completed and five prototype models be made and tested before the producer would be released for production. The prototypes and the tests were completed approximately in May of 1950. The vehicle was finally released for production in June 1950, and production was actually started on those vehicles in October of 1950.

Mr. RILEY. If you include the time necessary for getting the prototype and the tests, the lead time would be much longer than the 9 months; is that right?

Colonel ENGLER. Yes, sir; when we start on an initial order of a vehicle that has not been put in production yet, and we are starting out on the first order, it requires somewhere between 15 and 18 months before your vehicles are in production. There are a lot of variations in that you may start on a vehicle where you are going to complete the design phases and the design testing before you start production or you may start on a vehicle on which you have a finalized firm design which you give a manufacturer to produce. But essentially, if he has to set up facilities and initiate production for the first time, it requires in the neighborhood of 15 to 18 months before production actually starts for that vehicle.

In the transport vehicle class, a repeat order on top of that consumes in the neighborhood of 9 months lead time. For a combat vehicle it is approximately 11 months.

Mr. RILEY. Why should it take 9 months for a repeat order, if you have your assembly line set up and production going?

Colonel ENGLER. We have allowed 9 months from the time that the order is released from Washington to our field agencies to start procurement. There is an administrative lead time allowed in there of between 1½ to 2 months, which is consumed in the order getting to the district and the manufacturer making the initial proposal, the negotiations centering around that proposal, the preparation of the request for approval of the award, which comes to Washington and must be approved. It then goes back to the district and then there is the signing of the contract, and from the time the contractor gets the contract, which he must put into his purchasing department and issue purchase orders on his subcontractors. They, in turn, issue orders on mills and in some cases, such as in the case of steel, there is a lead time of 2 to 3 months before he gets in his proper place on the order boards and there are approximately 4 months involved in getting the materials, the basic materials, which are needed for the production.

General REEDER. I might comment there, sir, that they take 7 months from the time the manufacturer gets his contract for commercial trucks and before we had controlled materials, all of the truck manufacturers bid 5 months; 5 months was the shortest delivery time that they would give after they had a contract and that was without controlled materials. Now, with controlled materials, we will have to bid for the material to build those trucks even before we make a contract and 9 months ahead of delivery. We bid more than 9 months ahead; do we not?

General CUMMINGS. It varies from 11 to 14 months.

Mr. RILEY. You have to make your request for priorities 11 to 14 months ahead?

General REEDER. In our forecast requirements; yes, sir. You get nothing until you total up your requirements for controlled materials, submit them, and fight your way through the whole list of claimants who are all demanding more than there is available. So that there is a lot of jockeying.

Mr. RILEY. Are you getting all of the allocations of controlled materials that you need, or are some of them deferred?

General REEDER. Aside from construction material which has been a little tight, I do not think our production has yet been held up on account of their being controlled materials. We have had difficulties, yes.

Mr. RILEY. But there has been some delay in construction materials; is that right?

General REEDER. Yes, sir; construction steel has been very tight.

Mr. SCRIVNER. You lose some time in going through all the red tape to get your allocations? That has been your biggest loss?

General REEDER. It is essential red tape, sir. After all, it is a big business to bring together the requirements of the Nation for these materials, be sure that they are calculated with some semblance of accuracy, and then try to match requirements to the expected output and then make cut-backs here and there.

Mr. SCRIVNER. What portion of the material output does the military require percentagewise? It is fairly small; is it not?

General REEDER. Yes.

Mr. SCRIVNER. About 10 percent?

General REEDER. It varies with the material, but it is higher in aluminum.

General CUMMINGS. It would be higher in aluminum and particularly in alloy steels; that would be a very high ratio.

Mr. SCRIVNER. What would be the ratio?

General CUMMINGS. I do not have those figures, but we can get them, if you wish.

Mr. SCRIVNER. Pardon the interruption, Mr. Chairman.

INVENTORY OF VEHICLES

Mr. RILEY. What is the total number of noncombat vehicles that you have in each of the four categories listed here—jeeps, ¾-ton trucks, 2½-ton trucks, and 5-ton trucks?

General REEDER. You mean in these estimates?

Mr. RILEY. No; how many do you have on hand and what is the date of that inventory?

(Off the record.)

Mr. RILEY. Do you have a breakdown among the four categories in your statement?

Mr. SCHULMAN. I have the figures here from which I can pull them together, sir.

Mr. RILEY. Please insert them in the record at this point.

(The information requested was furnished for the committee files.)

VEHICLE PROCUREMENT STATUS

Mr. RILEY. What do you have on order presently and what do you propose to buy in 1953?

(Off the record.)

Mr. RILEY. That is for 1953, provided you receive the appropriation you are requesting?

General REEDER. That is right.

Mr. RILEY. How many did you have in 1952?

General REEDER. To find the number on order, it would have to be as of a given date and we would have to work it back to this figure that Mr. Schulman is working out. We can tell you what the total is.

Mr. RILEY. Will there be other contracts let in 1952, before June 30?

Colonel ENGLER. We have not made all of the contracts for 1952 yet. I can give you the figures from 1949, 1950 and 1951 and also the quantity of the contracts yet to be placed, if that is the way you would like it.

Mr. RILEY. I thing if we are furnished the number to be contracted for out of 1952 money, that would give us the information we want.

General REEDER. Some of those from prior years have been delivered and are in the inventory.

(Off the record.)

Mr. RILEY. In placing orders for that many between now and June 30, will you not be rushing the manufacturer?

Colonel ENGLER. No, sir; negotiations are complete, approval has been had and it is within the required lead time in order to maintain the current schedule.

Mr. RILEY. About how many of these vehicles do you have to place on order in order to keep your industrial base operating at minimum requirements?

Colonel ENGLER. In 1953?

Mr. RILEY. What is the minimum number that you estimate is required to keep your industrial base operating for manufacturing these vehicles?

General REEDER. Actually, that is the number requested here in the 1953 appropriation.

Mr. RILEY. In other words, you estimate that this is the minimum number required to keep your operating base firm?

General REEDER. That is right, sir.

Mr. RILEY. Is that in addition to the vehicles that you had expected to have to furnish in order to meet our obligations under the Mutual Security Program?

General REEDER. This is in addition to the Mutual Security Program.

Mr. RILEY. What will happen if the Mutual Security Program is cut down? Will that mean that you will have to close some of your production lines?

(Off the record.)

Mr. RILEY. Are some of these 1952 vehicles that you are budgeting for, for MDAP?

General REEDER. That is what I am trying to find out, whether the number in there is correct. From what I have learned I am afraid there is a mistake. The number entered in the production schedule is not that many and, if that is so, then we are even worse off than I thought.

(Discussion off the record.)

VEHICLE RESERVE

Mr. RILEY. What proportion of your 1953 orders will go into the reserve?

General REEDER. All of them.

Mr. RILEY. All of the 1953?

General REEDER. Will be reserve. The purpose is to provide, one, a production base, and, two, we push on into the reserve.

Mr. RILEY. How did you arrive at the figures for the ultimate reserve requirements?

General REEDER. Those are calculated in the same way that I described the making up of the Form 519–B. First of all we expect to have a certain number of divisions going overseas, which are not now in the active Army and therefore can calculate how many trucks they will require for initial equipment. Then, based upon the average number of divisions and troops which will be fighting during the year and the number of trucks which they have, we can calculate about how many will wear out. In the last war these tactical trucks lasted a little under a year under the conditions in which they were operating.

Finally, the flow of vehicles to support that, to give a 6 months' pipeline. We must have what amounts to a 6 months' supply moving up from the factories at the end of the year.

The last, of course, is based on the number of divisions then employed; not the average number of divisions. Those three taken together give you the size of the war reserve for trucks.

Mr. RILEY. This reserve is for the United States' requirement alone; is that right?

General REEDER. That is correct.

Mr. RILEY. And not for anybody else?

General REEDER. That is correct. May I go a little further and say that in the case of a 9-month lead time item, such as this, we do not expect as long as we have going production lines to accumulate the entire war reserve, because on D-day, the beginning of a war, we will place orders which will give us some production within the first year. Therefore, the amount of war reserve which we shoot at is less than this calculated requirement for the first year of the war.

Mr. RILEY. And you estimate your production capacity in connection with this reserve, too, do you not?

General REEDER. That is right, sir, and make that reduction.

(Off the record.)

INTERNATIONAL STANDARDIZATION OF VEHICLES

Mr. RILEY. Are any vehicles of this type being manufactured in Italy or France or England?

General REEDER. Yes, sir. Italy particularly is making something equivalent to it; not the same thing. To manufacture a Chinese copy of our vehicles sounds wonderful from the standpoint of standardization, so that you could interchange parts, and so forth. But in practice it is rather visionary.

In the first place we operate in feet and inches and they use the metric system. Consequently every drawing that we have has to be converted to the metric system.

The next item that makes it difficult is that they use a different system of projection in their machine drawings, so that the type of projection that we use, their layout men in their shop could not use; they could not read the drawings.

Another point in that connection. In the case of many of these vehicles there are proprietary secrets, more or less, and our manufacturers are very loath to give competitive industry their know-how.

The next item has to do with grades of steel which are available to make vehicles, or anything else, abroad. They are not quite the same as those that we have. Not only are they different, but even when they are the same, they go by different name. We have to have a code book to convert the types of steel which we manufacture and list in a specification to what would be applicable in England. But it would be still different in Italy.

So that one may say yes, let us manufacture jeeps overseas exactly like ours, but that is not sound. It is perfectly possible, and they are very capable of doing it, particularly in Italy, where Fiat has tooled up for mass production stuff, to make a vehicle in their way, which does the same thing as the jeep.

There is still another thing that I forgot to mention in this and that is that whereas our manufacturers are perfectly willing to have their own Government use their patents, they are not so keen about releasing them for use by foreign manufacturers. It means a licensing operation and, after all, we are still in a competitive economy.

Mr. RILEY. Very often we have the theory advanced by people in this country that we could save considerable money if we had some of these end items manufactured in these other countries toward whose economy we are contributing, because they could manufacture them cheaper and perhaps just as well. I am glad to have the reasons that you have suggested to illustrate some of the obstacles in the way of that policy.

General REEDER. Yes, sir. I should like to go off the record a minute, if I may?

Mr. RILEY. Yes.

(Off the record.)

IMPACT OF VEHICLE PROCUREMENT ON THE UNITED STATES ECONOMY

Mr. RILEY. Returning to your program, General, are many of these vehicles manufactured in the Detroit area?

General REEDER. The jeep is manufactured in Toledo; Studebaker is in South Bend; Reo is in Lansing, Mich.

General CUMMINGS. General Motors is in Detroit and has a plant in Pontiac. International Harvester is in Chicago. Diamond T is in Chicago and Mack is in Philadelphia.

Colonel ENGLER. A great many of the components and parts do come from the Detroit area.

General REEDER. Yes. Those go back to the Detroit area; that is, they have to go back there for a lot of the components.

Mr. RILEY. If your program were reduced because of lesser requirements in the mutual security program, would that have any effect, in your opinion, on the employment situation in the Detroit area?

General REEDER. Yes, sir; it would. That is, less in the matter of end items than in the supply of components, because the components industry which meets the end-item manufacturer's subcontracts is located largely in the Detroit area.

Mr. RILEY. Mr. Scrivner.

Mr. SCRIVNER. Mr. Chairman, in view of the large sums involved and in view of the fact that I have not been able to work out satisfactorily in my own mind some of the facts and figures relative to the T–18, request is made that General Reeder and members of his staff sit down with one of our staff members to discuss this particular problem at their convenience. I understand it cannot be done today because of another engagement that General Reeder has, but we hope it can be done at an early date.

(Discussion off the record.)

PROCUREMENT ACCOUNTING PROCEDURE

Mr. SCRIVNER. What is the accounting procedure for this?

Mr. STOREY. In prior years we used the appropriation made by the Congress to the individual services—for instance, Army or Navy. Beginning with this year there was authorized an Ordnance consoli-

dated procurement account which is really a compressed account operating on a 1-year basis, which is used to fund all requirements in certain areas where more than one service is procuring. In other words, it is a central account. It is authorized by title IV of the National Security Act and amendments of 1949. It is aimed at getting large procurements with many requirements coming from many different sources, as you heard this morning, sir.

(Discussion off the record.)

PRICES OF NONCOMBAT VEHICLES

Mr. SCRIVNER. Now, do you have the actual prices paid for noncombat vehicles under your 1951 contracts, taking first your jeeps?

Colonel ENGLER. On the jeep, I can give it to you by budget and actual. The figure for the 1949 budget was $2,167 and actual was $2,689.

The 1950 budget was $2,500, and actual $2,827; 1951, budgeted at $2,689, and actual $2,840; 1952, budgeted at $2,702 and actual $3,136; the 1953 budget figure is $2,584.

Mr. SCRIVNER. What was the figure for 1952?

Colonel ENGLER. $2,702 and the proposed appropriation you have before you has a figure of $2,584.

Mr. SCRIVNER. What was your contract price on those that you have just placed?

Colonel ENGLER. I do not have that contract price with me, sir. The basic price of the vehicle is one-thousand-eight-hundred-and-some-odd dollars.

Mr. SCRIVNER. Then you have plus taxes and plus equipment——

Colonel ENGLER. Plus spares.

Mr. SCRIVNER. And plus and plus.

Colonel ENGLER. The latest basic price which I have recorded, with all the spares—the total cost is $2,025.10. We have, in computing the price for the 1953 budget taken advantage of a saving of some $125 which we believe we are going to get by reason of these simplification moves in this austerity endeavor.

Mr. SCRIVNER. Including changing the waterproofing?

Colonel ENGLER. That is right. We have allowed for that. That is how we get this $2,584, which brings the price down in line with that consideration.

Mr. SCRIVNER. Give us the price on the three-quarter-ton truck?

Colonel ENGLER. This is going to get complicated, sir.

Mr. SCRIVNER. I know.

Colonel ENGLER. We have about six body types that I will have to give you.

Mr. SCRIVNER. Can you give me an average?

General REEDER. Can you pick out the chassis and just give that?

Mr. SCRIVNER. That would just complicate it, would it not?

General REEDER. The chassis is the main part of the money.

Mr. SCRIVNER. You are going to give me the figure for 1949, are you?

Colonel ENGLER. I am going to give you the cargo without winch. The average for the fiscal year 1949 budgeted was $4,390; actual, $4,110; 1950 budgeted $4,300 and actual was $3,786; 1951, budgeted,

$4,110, actual, $4,538; 1952, budgeted, $4,304. I have no actual price on the 1952 procurement as yet.

The 1953 budget was $4,365 with spares; $3,358 without spares. The budget figure is a combination of the cargo M–37 without winch and with concurrent spares. The cargo M–37 without winch and without concurrent spares and the command car without winch and without concurrent spares—it is a combination of all three.

Mr. SCRIVNER. This in an average price. Where are you seeking funds for the spares? Is that another item?

Colonel ENGLER. No, sir. We are following the general policy that when we have procured sufficient vehicles to meet our initial issue demands the additional vehicles procured, after those additional demands are met, are procured without concurrent spare parts.

Mr. SCRIVNER. I cannot find your 1953 budget figure of $4,365. It looks to me as though it is $3,968.

Colonel ENGLER. $3,968 is correct. That figure is a combination of 3,235 cargo vehicles with concurent spare parts, 1,978 cargo vehicles without concurrent spares and 278 command vehicles making a grand total of 5,492 at an average price of $3,968.

Mr. SCRIVNER. In other words, you just averaged out for the purpose of the presentation of the budget?

Colonel ENGLER. That is right, sir.

Mr. SCRIVNER. What about the 2½-ton truck?

Colonel ENGLER. On the 2½-ton truck I will take the cargo M–34 without winch.

Mr. SCRIVNER. How close will that be to your average cost?

Colonel ENGLER. The average cost is $7,019 and that is with concurrent spares. I will take the cargo with winch. That is a little above. That is one-hundred-some-odd dollars above the average price.

The cargo without winch and without concurrent spare parts is the predominant vehicle in this budget, although the average is higher than that, because of other vehicles with winch that are also in here. I could shoot under it by one-hundred-some dollars or over it, whichever you prefer. The average is in between.

I will take the cargo with winch. I do not have the budget figure for 1949. The actual cost of the M–34 with winch in 1949 was $6,672.

In 1950 it was $6,442.

For 1951 I have the budget figure which was $6,673. The actual cost in 1951 was $9,990.

In 1952 the budgeted price was $8,859. I do not have the actual cost for 1952 yet.

The budget price for 1953 with spares, comparable to those figures that I have given is $9,404; without spares $7,234.

In this budget that you have before you the 2½-ton requirement is based on 2,237 cargo vehicles with winch and without concurrent spares, and 7,119 vehicles without winch and without concurrent spares, or a total of 9,356 at an average price of $7,019.

Mr. SCRIVNER. Let us take up the 5-ton truck. You had none in 1949. The actual price would be sufficient for 1950.

Colonel ENGLER. I will take the dump without winch. The tractor without winch is the predominant vehicle in the 1953 budget, if you prefer to take that.

The first actual price we have on that in 1951 is where we budgeted it at a cost of $13,000 and the actual cost was $15,715.

In the 1952 budget the amount estimated was $14,006.

In the 1953 budget the amount estimated with spares is $16,579 and without spares $12,753.

Mr. SCRIVNER. Where do you get the $16,966 for the 1953 figure?

Colonel ENGLER. That is based on the following break-out. Six dumps with winch and without concurrent spares at a unit price of $14,386.

Three hundred and thirty-three dumps without winch and with concurrent spares, $17,867.

Tractors with winch and with concurrent spare parts, 749 at $17,596.

A tractor without winch and with concurrent spare parts, 1,959 at $16,579.

Mr. SCRIVNER. So that here again you have used a cost figure that you give us as an average?

Colonel ENGLER. That is correct.

Mr. SCRIVNER. That is all right if the numbers within the classes are average, but if you have a predominant requirement for one at a higher price and a smaller number at a lower price or, vice versa, your average figure does not work out.

General DECKER. Is not this a weighted average?

Colonel ENGLER. It is a weighted average, sir.

Mr. SCRIVNER. It is weighted to take into consideration the higher number or the higher price?

General REEDER. Yes, sir. It took the total amount of money to buy what they needed. They divided it by the total number of vehicles and that was the average price as given in the budget.

Colonel ENGLER. Since the chassis are basically the same, the difference is in the different body types, whether it is with a body or with a dump—we do not get too much variation in that regard. That is, taking a small quantity as against a large quantity of a particular body type.

Mr. SCRIVNER. Somewhere in your statement you were talking about jeeps and we were told that there were so many on order and you had so many yet to procure. I believe that statement was made earlier this morning?

Colonel ENGLER. For the 1952 quantity, this quantity was on order against a quantity to procure.

Mr. SCRIVNER. That is more than you said last year you were going to procure with 1952 funds, is that correct?

General REEDER. Are you talking about all claimants? You are, are you not?

Colonel ENGLER. That is right, sir.

Mr. SCRIVNER. What is the figure now? I have three figures. This morning we were told you had one figure on order.

Colonel ENGLER. That is correct.

(Discussion off the record.)

REPROGRAMING JEEP PROCUREMENT

Mr. SCRIVNER. Who reprogramed it and when?

General REEDER. I had a part in that. After the budget went through, it had made no provision for Korea continuing during 1952. We had to go back, go over the whole works and put that in as a means of balancing up the program.

Mr. SCRIVNER. That was a lesser rather than a higher number of jeeps?

General REEDER. That is right.

(Discussion off the record.)

Colonel ENGLER. In some measure that was affected by the price. In other words, the amount budgeted would not buy the number which were programed, but would buy only the lesser number.

I gave you a total for the 1952 program.

Mr. SCRIVNER. That was the total for everybody.

Colonel ENGLER. That is correct.

Mr. SCRIVNER. All I am concerned with right now is the Army appropriation.

(Discussion off the record.)

Mr. SCRIVNER. I assumed when I saw that that there was a wide variance in the figures.

Colonel ENGLER. That is right, sir. The difference between that and the initial number that I gave you is due to the fact that since this program was made up and reflected by the other services, requisitions have come in from the other services in excess of what they had initially programed.

Mr. SCRIVNER. I am not going into the other services here. I am concerned solely with dollars for the Army.

General REEDER. There was price trouble. This shows the original amount.

Mr. SCRIVNER. That is what you asked for.

General REEDER. Then there was a reduction which was due to the price, trying to reapportion the money, so that the figure became the lesser number.

Mr. SCRIVNER. How much did you cut the amount?

General REEDER. The total cut was 2,375.

Mr. SCRIVNER. Here is what seems strange, looking at it from this side of the table. You come in 1 year and you say you need so many vehicles at such a price. Then later we find that you did not get that many after all.

General REEDER. That is right, sir.

Mr. SCRIVNER. Of course, that distorts the entire picture again.

General REEDER. That is right.

Mr. SCRIVNER. Then we are told that your estimated price for last year would be $2,702 and now we find that you did not quite get that price. That was the budgeted figure. We do not know what the actual price was; at least we have not been told yet. Then we go one step further and come to your 1953 presentation and you give us a budget estimate of $2,584 which is just about $175 per vehicle less than last year's estimate.

General REEDER. That is because of the number in there without spare parts.

Colonel ENGLER. You see, we prepare these estimates a good year in advance of the actual contract. We do expect some variation as between the amount we estimate and the amount of the contract. In general the probable variation would be of the order of 10 percent. It is possible that the price would be either too low or too high due to circumstances that we could not foresee so far ahead of time.

Mr. SCRIVNER. The trouble is, when your prices go up, we hear about that 10-percent increase. But we are never told about a decrease

or, if there is one, what disposition is made of the funds that you save. We are left in the dark. We take your figures when you submit your estimates. We do not have sufficient staff to go out and determine whether your estimate is an accurate one or not. It may have been made a year before. Then we are told about how you are getting the price down because you are changing certain specifications, such as waterproofing, and what not.

(Discussion off the record.)

Mr. SCRIVNER. We would assume from what you have told us that the price would be less than $2,702. It ought to be pretty close to your 1953 price. When you have a difference of $150 on a vehicle and you are dealing with thousands of them, you are getting up into the big money. I am curious to know what the picture is and, if you do not spend the money for jeeps, what you will spend the money for.

General REEDER. On that programing what they do is take the best price they can get at the time.

Mr. SCRIVNER. Surely; that is what you are supposed to do.

General REEDER. When we program and then reprogram, we try to do the best we can with the money. Where we are able to make any savings in this reprograming—for instance, last summer—the money went into the tank where we have been hit by a very bad price increase.

Mr. SCRIVNER. We are sitting over here on this side of the table. You tell us about the good things. We do not hear very much about when you get hit until that is brought out by the questioning. I should imagine, if some of the things that we are told are true, then one of the places where you are being hit hard on tanks is right in the Detroit Arsenal. And that, of course, raises the question whether the arsenal ought to be in the production of anything more than developmental vehicles.

General REEDER. It is proposed as fast as other producers come in that we will move over to them.

Mr. SCRIVNER. Incidentally, while we are on that subject, does anybody have any estimate of the real cost—including everything—at the Detroit Arsenal, where you do not use quite the same cost-accounting system that is used in business; where, if something in the tank goes sour, as for instance a turret, and has to go into the scrap heap, we hear very little about it, but that is part of the cost.

Can you tell us what are the comparative costs of the vehicle being made in the Detroit Arsenal as compared with that which is being made for you by American Locomotive?

General REEDER. We do not have a comparison on that. The best comparison you can make would be between the M–47 being made at Detroit and the American Locomotive which is making the 47.

(Discussion off the record.)

THREE QUARTER-TON TRUCK PROCUREMENT

Mr. SCRIVNER. We shall go into that a little later.

Let us get down to the ¾-ton truck where again we find some differences in the figures.

When you were giving me the price, you said that the 1952 budget was estimated on the basis of $4,302. Where do you get the difference between the two?

Colonel ENGLER. The $4,304 figure I gave you was for the M–37 without winch. That was the weighted-average price in 1952. There are three vehicles of that particular type. There is the truck ambulance for which the 1952 budgeted price was $5,570; the M–37 which is a cargo with winch for which the budget price was $4,628 and the M–37 cargo without winch for which the budget price was $4,304. Actually the 1952 budget price is a weighted-average price based on the number of vehicles of each of those particular types which were included in the 1952 budget.

Mr. SCRIVNER. Why do we not have a unit price in your 1952 presentation? You gave us an estimated price of $4,535 when the budget was presented last year. Now you tell us that the budget last year was based on $4,302.

Colonel ENGLER. No, sir.

Mr. SCRIVNER. All I can do is to put down the figures that you give me. I do not know whether they are correct or not. I have it right here. As you gave it to me, when I was asking about the 1952 ¾-ton truck, you said you did not have the contract price but that the budget price was $4,302.

Colonel ENGLER. For one type of vehicle, sir. I took in each case one type of vehicle.

Mr. SCRIVNER. If you do not give these answers on the same basis as you presented your request in 1952, how can this committee determine which figure you actually worked on? When you are dealing with thousands of vehicles, and there is a difference of $250 per vehicle, you are again getting into big money. And that money is left rattling around there to be used for something else when we have been told that it is needed for trucks. We are getting into a situation that is becoming unbearable, because it demonstrates how little control Congress has over the expenditure of these funds.

You come in and give us a song and dance about so many thousand vehicles at so much per vehicle. In the case of the ¾-ton truck that gives you $103 million. If you need $103 million for ¾-ton trucks, that is one thing. But if you tell us you need that much, and then find you do not need that much, that is something else. That is something that I am trying to find out.

The same is true of the 2½-ton truck. For instance, here is a discrepancy in the figures.

(Off the record.)

Colonel ENGLER. No, sir.

Mr. SCRIVNER. That was at least on one type of truck. That is the figure I wrote down, $8,859.

Colonel ENGLER. I took one particular type of vehicle and followed it through.

Mr. SCRIVNER. But the figures we were given in your request last year make a difference of 6,000. Now, 6,000 trucks at $8,000 apiece is another good chunk of money that is rattling around. Where is it?

General REEDER. We could not buy that many. The price went up.

Mr. SCRIVNER. What happened to the money?

Colonel ENGLER. If you take that particular vehicle, the one that I followed through with, the M–34 without winch, I gave you the actual price in 1951 which was $9,900 and the budget price in 1952 which was $8,859.

Mr. SCRIVNER. Where is the difference between the figure that you gave me and the one that was set out as the quantity that you were going to procure with 1952 funds?

General REEDER. It is roughly in the price change.

Mr. SCRIVNER. It did not change that much surely.

General REEDER. Yes, sir.

General CUMMINGS. More than that, sir.

(Discussion off the record.)

General REEDER. The price change was about 10 percent and the difference is about 10 percent. The price goes up and the quantity goes down.

Mr. SCRIVNER. For what price are you getting them, in 1952, for those that are under contract?

Colonel ENGLER. I do not have the actual contract price for 1952, sir.

General REEDER. In the reprograming what they did was to use the last price out of 1951. In other words, they got a different price.

Colonel ENGLER. In order to reprogram at the beginning of the fiscal year, it is necessary to use the last realistic price, to establish your program for the incoming procurement year.

Mr. SCRIVNER. But that program price drops and the amount of money that you spend for that particular item is less?

General REEDER. No, sir; it is the same. That is precisely it.

Mr. SCRIVNER. If your actual contract price were lower than the price you estimated?

General REEDER. Oh, yes; but it has not been yet.

Mr. SCRIVNER. It has as to some of them.

General REEDER. We have yet to see that lower contract price.

Mr. SCRIVNER. If you have not, then you have not been giving us a realistic picture of your estimates; have you?

FIVE-TON TRUCK

Mr. SCRIVNER. Let us go down one more. Coming down to your 5-ton, you told me that you anticipated procuring with 1952 funds this number for the Army., is that right?

Colonel ENGLER. That is right, sir.

Mr. SCRIVNER. Yet in the presentations made to us a year ago we were told you were going to procure more.

Colonel ENGLER. That is right, sir.

Mr. SCRIVNER. How much difference is there in the price? You cannot make me believe it doubled. You cannot explain the difference this time by the fact that your price doubled and so you cut your number in half. That makes a considerable difference because those trucks are $15,000 apiece.

(Off the record.)

Colonel ENGLER. No, it does not vary that much, sir. I can go right down the prices here. The dump with winch, the 1952 budget price is $17,331. The price paid in 1951 is $18,934, that is $2,000 there. In the dump without winch the 1952 budget price was $16,975. The last price paid in 1951 was $18,215.

In regard to the tractor, the budget price in 1952 was $14,493. The actual price paid in 1951 was $16,535.

Mr. SCRIVNER. That still does not make up the difference.

General REEDER. No, and it very definitely will not. In the case of the 5-ton truck, sir—and you may correct me if I am wrong—the reprograming reduced the number because of the axle problem. We could not produce them as fast as we wanted to.

Mr. SCRIVNER. Let us concede all that.

General REEDER. All right.

Mr. SCRIVNER. Can you tell me approximately pretty close to how much your trucks are going to cost you?

(Discussion off the record.)

Mr. SCRIVNER. All right. There is about $40,000,000 less than the request.

General REEDER. That is right.

Mr. SCRIVNER. Now where do you transfer that money?

General REEDER. To the medium tank.

Mr. SCRIVNER. Everything cut from other programs is going into tanks now?

General REEDER. Generally speaking, yes.

Mr. SCRIVNER. You must have missed your estimate on the cost of tanks considerably.

General REEDER. We did very badly. We estimated what?

(Discussion off the record.)

General REEDER. That is right, sir. The contract price we are talking about is in the contracts with Fisher, Ford, and others.

Mr. SCRIVNER. Of course, that demonstrates if these estimates are to be worth anything we have to have better manipulating of a slide rule. Either that or we might as well wash out all of this itemized justification and just say that that is the over-all figure.

General REEDER. I would not want to do either.

Mr. SCRIVNER. But as it is working out that way, we have surely been wasting a lot of time.

General REEDER. However, the basis on which we go out to buy is still the American method of a willing buyer and a willing seller, and the price is determined by what you can get it for. We still do not believe it is going to cost $300,000 to make a tank. We do not believe it, but we could not get any better contract with them than that. When the price is redetermined, if we are right, the actual cost will be no greater, and if we are wrong that will be the price. Unfortunately that will be determined sometime in the future because we will not get a price redetermination on Chrysler for a year and a half, I would say.

General CUMMINGS. About a year. We will shortly have one redetermination on American Locomotive, which will be the first one in the medium tank program.

General REEDER. But American Locomotive is an early contractor and was a lower price originally than Chrysler, Ford, or Fisher. Ford and Fisher are not due to come in until later, so that we will not have a price redetermination with them until after Chrysler.

General CUMMINGS. At least.

Mr. SCRIVNER. You can see where we sit. Last year you had a program just involving these items, or $1¼ billion.

General REEDER. We are in the same boat with you.

Mr. SCRIVNER. I know. That is the trouble. We expected you to bail us out and you have not been bailing very fast, and the boat is leaking. It is becoming almost a submarine without any periscope.

General REEDER. When you try to run a show in the face of this kind of price increase and run a Korean war on jawbone, which is what we are doing, the program becomes quite a trick.

Mr. SCRIVNER. Yes, I have been sitting on this committee now for several years and I feel more futile each year. I am still trying to reconcile some of these figures, which apparently I will never be able to do.

ACCURACY OF PRICE ESTIMATES

We will go back again to the 2½-ton truck in 1952. You do not know what the exact contract price is, but when you make the presentation this year you give us a weighted figure of $7,000, which is lower than the figure we had before.

Colonel ENGLER. That is right, sir.

Mr. SCRIVNER. We have no way of knowing now whether that is a good or bad figure. We do not know whether when you come back next year you will have ordered the number which you say you need, or whether you ordered more or less. I do not know what you are going to do. I do not know how the chairman feels, but I simply feel this way: You are dealing with a program as large as this and then you do not procure as many as you say you are, or as many as you were going to, and then you take the money which was provided in the 1952 budget for these trucks and was not spent for that purpose, but was transferred to a tank program, and for the first time we now find the cost of the tank is going to be considerably more than we were told it was going to be before, and we have heard nothing about it until now. That is not a pleasant picture.

Of course, that may only mean that that is what might appear on the surface, perhaps, but the end result is that all the time taken last year in presenting your truck procurement program, and all the time taken on your tank procurement program is practically a waste.

General REEDER. No, sir, I would not say that.

Mr. RILEY. When did you find that this tank would cost $60,000 more than you estimated?

General REEDER. When we tried to come to an agreement with the companies.

Mr. RILEY. When was that?

General REEDER. It began along around last June or July, I believe.

General CUMMINGS. We had our first prime contract, our definitive contract, as I recall it, with Chrysler, in June last year.

Mr. RILEY. But this is the first time it has been mentioned to this committee, is it not?

General REEDER. It is the first time we have definitely been in a position to do so.

Mr. RILEY. But the committee was in session last October.

Mr. SCRIVNER. What tank is that?

General REEDER. We are talking about the medium tank.

Mr. SCRIVNER. Are you getting any this year?

General REEDER. No. There are none in this year's budget.

Mr. SCRIVNER. So all you are doing is carrying your production over on previously appropriated funds.

General REEDER. That is right.

Mr. RILEY. 1952?

General REEDER. 1951 and 1952. We started that program by converting some M–26's earlier.

(Discussion off the record.)

Mr. SCRIVNER. Last year in the request for your funds for the M–47 tank you told us that you were going to procure a definite number of tanks at a specified unit price. As we get the picture now your total cost is going to be raised considerably because you tell us that your procurement cost is going to be——

General REEDER. We could not buy that many. We are limited.

Mr. SCRIVNER. Wait a minute. Let us phrase it a little differently then. From what you tell us now if you procure that number at the cost of $300,000, to put it in round figures, that will add more than a half a billion dollars, or would add more than a half a billion dollars to that tank program.

Are you going to procure the original number and spend the added money or, inasmuch as prices have gone up, are you going to cut down on the number of tanks and still spend about the same amount of money?

General REEDER. We are cutting down on the number of tanks and spending approximately the same amount of money.

Mr. SCRIVNER. If you are doing that, why was there any need then to transfer to the tank program the millions of dollars that were not going to be spent on your truck program?

General REEDER. Because the purpose of the program was to procure as nearly as possible that number of tanks, and that is one of the outstanding things which we need for war.

Mr. SCRIVNER. General, it can be only one of two things. Either as you just told me now, you are going to cut down on the number and spend approximately this sum.

General REEDER. That is right. It did not increase very much.

Mr. SCRIVNER. Yet a while ago we were told inasmuch as you did not go ahead and procure the number of trucks you were going to originally, which we were told last year you were going to procure, that the money that would have been spent for trucks was being transferred over to the tank program, as you told us.

General REEDER. That is correct, sir.

Mr. SCRIVNER. If you are going to cut down the number and keep this same amount of money to be expended——

General REEDER. Just a minute. Let us see how it does come out in an approximation.

Mr. SCRIVNER. Let us see how it does work out.

(Discussion off the record.)

General REEDER. The difference of about $100,000,000 was not very great, but that represented everything we could put in.

Mr. SCRIVNER. When you compare it to the size of the program it is not great.

General REEDER. No. It is not great at all.

Mr. SCRIVNER. But when you start talking about dollars it is a terrific amount.

General REEDER. It is a terrific amount of money. That is right.

Mr. SCRIVNER. I suppose it would serve no useful purpose then, in view of the development now, to go into any of these others. I suppose that would be pretty much the same.

General REEDER. Yes, sir. That is right.

Mr. SCRIVNER. You tell us one year that you are going to buy so many at so much, and then you change your program and buy fewer and use the money for some other program.

General REEDER. We bought fewer up and down the line.

Mr. SCRIVNER. Now what is your final figure on the number of tanks.

(Discussion off the record.)

Mr. SCRIVNER. Are they all now on order?

Colonel PROSSER. They are not.

(Discussion off the record.)

Mr. SCRIVNER. Do you have some prior year funds in this?

Colonel ENGLER. Yes, sir. There are some MDAP's in this.

General REEDER. Military assistance.

Colonel ENGLER. There are Marine Corps and MDAP funds in there.

Mr. SCRIVNER. What is the T–39?

General REEDER. We went out with Chrysler before we had Army money available and placed the first order with MDAP funds.

Mr. SCRIVNER. All I was concerned with was the Army procurement out of funds requested in this appropriation. I assumed that those were the figures I was being given.

General REEDER. Yes, you are.

Mr. SCRIVNER. No, I am not. I am being given everything. I am apparently being given everything—Army, MDAP, and everything else.

Colonel ENGLER. They are all together, sir. As far as the contract itself is concerned I cannot differentiate.

Mr. SCRIVNER. You cannot tell which is Army and which is the others?

Colonel ENGLER. I cannot separate them out.

(Discussion off the record.)

EXTENT OF INFORMATION FURNISHED COMMITTEE DURING THE YEAR

Mr. SCRIVNER. When did you let your first contracts on this?

General REEDER. The first contract was not even a contract. The first was a project order on Detroit. The next one was American Locomotive.

General CUMMINGS. A letter contract.

General REEDER. Then we let letter orders.

Mr. RILEY. When was the American Locomotive contract?

General REEDER. The date of that order?

Mr. RILEY. The first.

Colonel ENGLER. December, I believe, sir.

General CUMMINGS. Of 1950. Chrysler came along in February.

Mr. SCRIVNER. It was 6 months before you made the presentation last spring, was it not?

Mr. RILEY. I thought you said your first order was in June?

General CUMMINGS. That was the first definitive contract, sir.

General REEDER. This last June. A year later was the first time we got a contract to supersede the letter order.

Mr. RILEY. You had the estimated price of $300,000 last June. Is that right?

General REEDER. Yes. On the first orders.

Mr. RILEY. The committee was in session until some time in August, as I recall it.

Mr. SCRIVNER. This committee was in session until October.

Mr. RILEY. But the hearings were until some time in August, or maybe the 1st of September. It would seem to me we ought to have been apprised of that difference then. That is a lot of difference.

Mr. SCRIVNER. It might not have made any difference in the eventual contracts, and perhaps not in the number of tanks, but it certainly made a lot of differences in the reception that the presentation would get this year, because you can well imagine our feelings, sitting on this side of the table, when we have been going along with the idea that the tank was going to cost about $250,000 or maybe $260,000, and then to find that the prices are over $50,000 more per tank. That comes pretty much as a shock.

General REEDER. I agree. We are not by any means convinced, as I say, that the ultimate price to the taxpayer is going to be so far up.

Mr. SCRIVNER. I personally pray that you are right.

General REEDER. The contract price remains that. That raises the question of how often and how fully we are expected to account to the committee.

Mr. SCRIVNER. Here is an item that runs into many hundreds of millions of dollars extra before we are through.

General REEDER. I know.

Mr. SCRIVNER. Of course, I cannot speak for Chairman Mahon, but he is chairman of the full committee. As just one member of the minority on the committee I would have felt much better about it if somebody had just said—even if it was nothing more than a letter—if somebody had just merely advised the committee to the effect that, "Although we presented this one figure at the hearings which we thought would be about the price at which the tanks would run, or what they were going to cost us, we now find that the actual cost is going to be more nearly this figure," whatever figure you found it to be. Then when we come along like this with these figures we would not be wondering about so many things. Of course, the Congress is not the administrative branch of the Government. That is your job. You are under the President and under the Executive, and it is up to you to administer it and spend the funds, and I hope spend them wisely. But at least we ought to be considered as part of the team, so that after this we will not be taken quite so much by surprise. A half a billion dollars in our program is a considerable sum of money, and that is what this amounts to.

General REEDER. That is right.

Mr. SCRIVNER. If the Defense Department had asked that we spend, let us say, $25,000,000 on some installation and they found that instead of $25,000,000 it was going to cost us $75,000,000, they would have advised us of that change. So, if they advise us of a $50,000,000

program change we certainly ought to have some slight word at least of a change of a half a billion dollars in the cost of a program.

General REEDER. As far as I am personally concerned——

Mr. SCRIVNER. Perhaps it is not your job to do that, but somebody should do it.

General REEDER. Yes. I am speaking without any prejudice either way, but it simply represents more or less a change in policy over what we have been doing. We have sort of come up here and given you our story, and then we come back and render our accounting, or have in the past rendered an accounting.

Mr. SCRIVNER. You never rendered much of an accounting on this truck procurement program until I brought it out in questions.

General REEDER. I think we did.

Mr. SCRIVNER. That was a billion-dollar program.

General REEDER. We have given you the number that was provided.

Mr. SCRIVNER. Yes. It is not here in front of us in a way that we can dig it out. That is, it is not plain. We can dig it out eventually, just as I have been digging it out. However, when a few instances like that occur it shakes the confidence of the committee in any presentation that is made. I will state frankly that from here on I will look upon any of the programs you have given us for truck procurement, tank procurement, ammunition procurement, gun procurement, and everything else, with a great deal of skepticism. I do not like to feel that way.

General REEDER. I do not believe you should, sir.

Mr. SCRIVNER. I would prefer ever so much to feel that we could sit back and take every word that has been given us at the absolute gospel.

General REEDER. Right, sir.

Mr. SCRIVNER. And in many cases it is. Now when you find a difference, we should know about it. Let us take just one example. Let us take the five-ton truck program over here.

General REEDER. I think it is about half.

Mr. SCRIVNER. Where we are told you are going to procure about half as many trucks costing $15,000, as you told us you were going to procure. I am always in favor of getting the smallest possible number of anything, but then I would like to know what happened to the money which you did not spend. If it is going to be transferred to some other program, this committee should know it. In other words, it makes it look as though in the haste with which you had to prepare your 1952 estimates, that somebody reached up in the clouds and grabbed a number and said, "Well, we have so much money and we will spend so much of it and buy so many trucks," and divided it into the total number at so much, and there you are.

General REEDER. No, sir. It was not computed in that way, nor was the programing done in that way. As you will notice with all of the other trucks approximately the same amount of money as has been appropriated or, rather, as had been estimated, was spent on the trucks, and it bought you fewer trucks because the price increased. In this case we had an additional factor that entered into it in that because the axle supply for trucks of that size was inadequate and Timken had to be tooled up, and is not yet completely tooled, we could not produce as fast as we should and, therefore, we purchased only

those which could be produced. The savings, or the difference, went into a program which you had already approved, that is, that of buying tanks.

I do not believe we have in any way trespassed upon the intent of Congress. It is perfectly possible and perfectly proper that you should have been better informed, and more quickly. I have no hesitation in saying that.

Mr. SCRIVNER. You have had far more time to prepare the 1953 presentation and I would assume that having had that much more time your estimates would have probably been more firm than in the 1952 presentation, because you know better than I do that you had to work under a lot of pressure in making up the 1952 presentation, and I realize it. I will take you pretty much on faith for one more year.

General REEDER. I will tell you very frankly, when you come to 1953 there could not have had much more pressure on us than they did.

Mr. SCRIVNER. You had more time.

General REEDER. We should have had more time, sir, but on account of the difficulties from political, fiscal, and other reasons of determining just what they wanted to do, we were late in getting the news.

AMMUNITION AND GUIDED MISSILES

Mr. RILEY. We will take up the next subject, which is ammunition, General Reeder.

General REEDER. On the ammunition program I would like to make a brief statement and then follow it with some extemporaneous remarks.

Mr. Chairman and gentlemen: there is no element of the procurement and production appropriation for fiscal year 1953 which requires graver consideration than this ammunition program. Not just because it represents the greatest portion of our major procurement request, but principally because it is the lifeblood of our forces in Korea and of any initial effort in the event of an all-out war, is our ammunition program so important.

In my opening statement of this appropriation, you were told of the inroads in our war reserve of ammunition, caused by the continuation of the Korean conflict into fiscal year 1952. Remembering that the Korean War has been going on now for 20 months, during which time we have been living off our World War II reserves——

(Discussion off the record.)

More serious than this long-range concept of replacement of war reserves, is our current stock position of ammunition.

(Discussion off the record.)

Yet, at the end of this month, we must begin shipments to Korea of ammunition which will be consumed there in July, although our budgetary assumption would imply this is unnecessary. Regardless of assumptions used to determine budgets, we must continue to ship ammunition and other supplies to Korea and, in consumption items like ammunition, this requires a continuation of a high level of production with its subsequent high cost.

Should the war in Korea end abruptly, the fiscal year 1953 estimates will enable the Army to reestablish a reasonable level of balanced war reserves of ammunition by the time of our new readiness objective.

(Discussion off the record.)

Should the war continue in Korea into fiscal year 1953, a large appropriation will again be required in fiscal year 1954.

With respect to our guided missiles program, the advances made in this field are reflected in the increased funds requested in fiscal year 1953 over the past 2 years.

(Discussion off the record.)

Mr. SCRIVNER. General Reeder, then in view of some of the statements or matters we have discussed off the record, in 2, or 3, or 4 days from now, there will be a further presentation made on ammunition requirements?

General REEDER. Yes, sir. Maybe before that.

Mr. SCRIVNER. Well, it will be made within that time.

General REEDER. Yes.

Mr. SCRIVNER. Thank you.

TUESDAY, MARCH 11, 1952.

GUIDED MISSILES

Mr. RILEY. General Reeder, which project are you going to present to us this morning?

General REEDER. We would like to proceed with the guided missiles project, project No. 1400. We shall not take up the ammunition item until we come back with a little more data.

Mr. RILEY. Do you have a statement to make on guided missiles, General Reeder?

General REEDER. No, sir. I am going to turn to General Cummings and General Davis to describe the program to you.

Mr. RILEY. General Davis, we are glad to have you here and would be glad to receive any statement you wish to present.

General DAVIS. We have finally, on two of our Army guided missiles reached the production stage. For many years Army Ordnance people appearing before this subcommittee have simply talked about futures. Now some of these missiles are a reality.

You will note in the breakdown of project 1430 that roughly three-fourths of the funds requested are concentrated on two missiles now in production. The remaining quarter of the funds is scattered over a lot of new ones which are being made in smaller quantities for continued experimentation.

I have with me Colonel Petrolino and Colonel Toftoy who are here to answer any questions you may have on the details. They practically live with these instruments.

Mr. RILEY. The two for which you are requesting the major part of the appropriation, are actually in production?

General DAVIS. That is right.

Mr. RILEY. And they are considered usable missiles at this time; you can get good results from them, is that right?

General DAVIS. That is correct.

Mr. RILEY. The others are still in the development stage?

General DAVIS. What we have begun to do in the case of these missiles generally is, as soon as they get to a point where good performance is obtained, we start them in at least limited production but with the point of view of real production. That has several advantages. One of the biggest is that you get product engineering done while the

missile is stilled classed as experimental, which saves an enormous amount of time later.

COST OF GUIDED MISSILES AT PRODUCTION STAGE

All of these missiles, or almost all of them, are highly complicated. Most of them have been and still are horribly expensive. But one of the big ideas in getting into production, getting the product engineering done is to get prices down so that they may be considered comparable with other ammunition items.

Mr. RILEY. Has production reached the stage yet where the cost of the missile is being reduced?

General DAVIS. Yes, indeed. Would you like to make any comment on that, Colonel Petrolino?

Colonel PETROLINO. Yes, sir. I would like to make one remark. We currently have orders on that first item, and the cost of the reorder is estimated to drop approximately 33⅓ percent.

Mr. RILEY. You are reducing the cost about 33⅓ percent?

Colonel PETROLINO. Approximately. Those are the engineering estimates.

Mr. RILEY. As to the other one, is the cost of that being reduced comparably?

Colonel PETROLINO. It has been reduced by a certain percentage.

(Discussion off the record.)

General CUMMINGS. I would like to make it clear that the present cost is not based on actual production in quantities. It is the original estimate for current production. The revised figures given are based on further progress in pilot manufacture, limited production and refined engineering estimates.

Mr. RILEY. You expect the cost to be still further reduced when you get into mass production?

General CUMMINGS. We should so hope; yes, sir.

Mr. RILEY. You are asking $400 million for this program. Is that more than you had for the current year?

General CUMMINGS. Yes, sir.

Mr. RILEY. What was the amount that you had?

General CUMMINGS. $253 million.

Mr. RILEY. Would you explain why you are asking for an increase of approximately $150 million?

General DAVIS. The two missiles which have been mentioned, have now gotten to the stage of satisfactoriness, where we are ready not only to produce them for more extended firings but we are actually organizing units to use the missile.

(Discussion off the record.)

Mr. RILEY. I note there is a request for $14,000,000 plus in research and development for this same project. I understand that your people put on the field tests and any bugs that develop are referred to the technical people to work out?

Colonel TOFTOY. That is right.

Mr. RILEY. And the $14,000,000 is to take care of that part of the program—the laboratory part?

Colonel TOFTOY. That is correct.

Mr. FLOOD. You were asked why you could not run both these shows at one time. Since you have to use the missile for experiment, why can you not run the technical and experimental units at the same time? That sounds like a very intelligent question to me. Following that, why do you have part of your request for air defense dedicated to training equipment? What is the difference between training equipment and tactical equipment? Since you are going to use exactly the same missile, why do you want more money for that? You are going to build launching platforms and launching units. Why don't you build them and make them tactical?

Colonel PETROLINO. There is a certain amount of tactical equipment.

Mr. FLOOD. Then it says "training equipment." Training equipment would indicate to me the launching units to launch missiles. If you are going to use exactly the same kind of missile for training as you use for tactics, and it will cost exactly the same amount out of our stockpile, why must you particularly earmark money for training equipment?

Colonel PETROLINO. You must operate schools to train new cadres for new organizations. What we are doing is this: Our tactical sets will be used to activate batteries—for battalions and batteries.

Mr. FLOOD. What will be the difference in cost between the tactical sets and the training sets, why will they be built any differently, and how can they be built differently if you have to launch the tactical missile?

Colonel PETROLINO. A lot of the training equipment is not a complete tactical set, in that it has to be broken down as a training set. Actually it won't be a full operating battery set. It will be simulated methods, where you have to have training equipment for school purposes.

Mr. FLOOD. You mean this dry run stuff?

Colonel TOFTOY. In some of the classrooms we have what is skeletonized missiles; others have, for example, a table and they will have the various components laid out and operating, of the electrical and pneumatic type, for people to work on, and there will be training aids of other kinds. There will be simulators which give an artificial check on training without actually having to shoot the missile.

Mr. FLOOD. Will you give us a breakdown of what part of the request is to be devoted to this kind of training equipment that you are now describing?

Colonel PETROLINO. The total listed in the 1953 estimate for test and training equipment is $6,480,000.

Mr. FLOOD. What is the difference between testing equipment and training equipment?

Colonel PETROLINO. Testing equipment is equipment to be used in the schools and in separate units for testing the missile, and check-out the equipment—the missile and the ground equipment.

Mr. FLOOD. Does this $6,480,000 include testing and training equipment.?

Colonel PETROLINO. Testing and training equipment.

Mr. FLOOD. And out of the $186,000,000, $72,000,000 is for missiles?

Colonel PETROLINO. That is correct.

Mr FLOOD. Then you have $78.4 million for missiles, testing, and equipment. How much does each battery set cost, about?

(Discussion off the record.)

Mr. FLOOD. Then the $6.4 million is for testing and training, if that is what testing and training equipment is, and you tell us you use tactical missiles for training. On what do you use the tactical missiles for training purposes?

Colonel TOFTOY. In the same way, in artillery batteries, we used to have annual target practice. The tactical equipment must be used as a final check in training.

Mr. FLOOD. You take your cadre out to the field where the tactical operation is in process, and fire it there?

Colonel TOFTOY. That is right.

Mr. FLOOD. You have no new set-ups of battery sets for operational firing for students; that is out in the field of tactical operation?

Colonel TOFTOY. The final term of training will be out in the field with tactical equipment and actual firing.

Mr. FLOOD. We want that on the record so that next year this subcommittee knows exactly what your request is going to be and you do not come up here and tell us you want $40,000,000 for students and $120,000,000 in the field. And that has happened. We are not going to have that kind of problem for these students in this kind of operation, are we?

Colonel PETROLINO. If the test and training equipment allowed in the 1953 budget is sufficient to cover the requirements in the Army for these four classes, it should not appear again. It all depends on how many the schools want—what the rate is.

Mr. FLOOD. You are supposed to know that. They are not going to build up more training schools for 1953 than you are going to get from us for testing and training equipment. You promise us that. And that being so, what is the answer to my question—"Yes," or "No"? The question was, Do you assure us that in the testing and training equipment for students you fire the tactical missiles for training, under the system just described?

General REEDER. The answer is "Yes."

Mr. FLOOD. It had better be "Yes." We do not want two separate operations. You do not want this to become one of those GI school operations which will take place in the middle of the final period.

GUIDED MISSILE PRICE CHANGES AND REPROGRAMING

Mr. SCRIVNER. I was interested in your statement that you anticipate the cost will drop from approximately $45,000 to $30,000 and, as near as I could run out your figures, that is what you propose. When you are making your request here for the given number of missiles, you are earmarking—and I say that with some reservation, because we have found that earmarking has not earmarked too well—the designated amount.

In the last few days, we have run into some rather grave disappointments, since we have found that some of the prices we thought we were going to get some equipment for were overly optimistic and, instead of costing what we thought had been set aside as the cost price, the items have cost considerably more.

How firm is this guess of yours, and I am terming it that now, because I think it is a guess—how firm is this guess of yours that they will be down to $30,000 for this last production lot?

General CUMMINGS. The contract for the original quantity should be signed within a week. As I stated, prior to this there has been no actual production to date. We will not have a redetermination under this original contract until probably October of this calendar year. Until that time, we will not have actual prices based on production experience.

Mr. SCRIVNER. What are you going to do? Suppose you find when you do get into your renegotiation and get a firm figure that, after all, it is not going to be $30,000, but we will be fortunate in getting it down to $37,500. Are you going to cut down on the number of missiles you will procure, or are you going to get the same number of missiles at a bigger price than you now anticipate?

General CUMMINGS. Unless additional funds are made available——

Mr. SCRIVNER. Wait a minute; I ask you a simple question—Are you going to procure a smaller number at the higher price, or are you going to get the same number and then come in and ask us for more money, or will you shift some funds from something else to this program, as has happened in other programs?

General REEDER. I think I had better answer that.

Mr. SCRIVNER. Well, somebody should.

General REEDER. As a general rule, if we run into higher prices, we buy fewer. Now if the situation is——

Mr. SCRIVNER. Then what we heard yesterday and the day before was the exception to the general rule?

General REEDER. No, sir; we bought fewer.

Mr. SCRIVNER. I am talking about tanks.

General REEDER. The 5-ton truck was the only one.

Mr. SCRIVNER. But you transfered that money to another program that was costing us more than we were told a year ago it would cost.

General REEDER. That is right. They were all costing more; every one of them. Now we have a choice. This thing is geared at a certain quantity a month. That is considered as sort of an optimistic figure by Mr. Keller. If we have not money enough to make this quantity a month and they can possibly operate the line on 10 percent less, that is what we would do. But if we positively cannot get along with less than the 10 percent reduction or something like that, and we did not have quite enough money, we would look around to see if there was some less important project from which we could take the money——

Mr. SCRIVNER. What less important project do you think that would be?

General REEDER. I would not know right now.

Mr. SCRIVNER. If you can tell us what that less important program is, maybe we can do some shuffling and cutting here, too. What I am trying to do is to keep some of this power of shuffling, cutting and reducing programs in the hands of Congress and not leave so much to the military.

General REEDER. If you do that, if we are not to use the best judgment we can, then I do not know how it will work. We present the program to you——

Mr. SCRIVNER. That is right; but there have been a few things happen that have left me a little dubious about how good that best judgment is.

General REEDER. Our program here is to produce a certain number of missiles and battery sets.

Mr. SCRIVNER. So all we can do is to hope and pray that your guess that you are going to be able to get the price down to $30,000 is a good guess.

General REEDER. We are right with you on that.

PRICE REDUCTION ON REPETITIVE AMMUNITION PRODUCTS

General DAVIS. I think, Mr. Scrivner, since I represent the ammunition business, we have a little chance to be proud of the fact that on a repetitive product such as ammunition our methods of making things are not by any means static. We have made some reductions in this as the result of last year's experience, and cutting the 1953 budget by prices that I think are quite amazing. The price reflected in here of the 155 milimeter projectile is down in this budget. Of course we have the complete loaded projectile listed here, but the price of the empty projectile we have down now to 14 percent more than the World War II average. You know what labor and materials have gone up; and why are we able today to make that projectile at only 14 percent more than the World War II price? It is just by using production tricks; that is all. I think that is very significant.

I simply cited that as a case of repetitive products, we are learning to produce things cheaper. We are having to do that.

Mr. SCRIVNER. And about the time you get to doing that, then they will ship you off to some other job and we will have another man in your place and he won't have the benefit of your know how.

General DAVIS. I do not know. They have allowed me to spend most of my military life in this ammunition business, and I have less than 2 years to go and they probably won't take me off.

SURFACE-TO-SURFACE MISSILE

Mr. RILEY. Now I think it would be well to talk about the first surface-to-surface missile next, since that is the next most important. Will you describe the mission of that?

(Discussion off the record.)

Mr. RILEY. In your opinion will it reduce the requirements for conventional artillery?

Colonel TOFTOY. This will supplement conventional artillery by extending the range, carrying much heavier war heads, and give us an all-weather, day-and-night weapon for close support of the field forces. With regard to those missions, it will augment also close air support.

Mr. RILEY. But it will not reduce the requirements for heavy and long-range conventional artillery, in your opinion?

Colonel TOFTOY. I don't know, sir.

Mr. FLOOD. For what types of war heads will it be used?

Colonel TOFTOY. This will be used for all types of war heads.

(Discussion off the record.)

Mr. RILEY. Are you training field units?

Colonel TOFTOY. In the same way as the air defense missile.

Mr. RILEY. How many are to be set up this year?

(Discussion off the record.)

Mr. SCRIVNER. And the other units will follow along?

General REEDER. As the equipment becomes available.

(Discussion off the record.)

Mr. FLOOD. What percentage of the request for this surface-to-surface guided missile will be dedicated to testing and training equipment?

Colonel PETROLINO. Three and six-tenths million.

Mr. FLOOD. And of the same nature, purpose, and intent as described to us for testing and training equipment for the air defense missile?

Colonel PETROLINO. Yes.

Mr. FLOOD. What will be the cost of a single battery set in dollars?

(Discussion off the record.)

Mr. FLOOD. How much will each individual missile cost for the number requested?

(Discussion off the record.)

Mr. SCRIVNER. Let us go back a step and see if we understood each other. My recollection was when we were first talking about this missile this morning we were told the first ones in procurement in small quantities, of course, was $82,000; is that correct?

Colonel PETROLINO. Yes.

Mr. SCRIVNER. Then I thought I understood you to say you hoped to get the next procurement at $75,000?

Colonel PETROLINO. Yes, sir.

Mr. SCRIVNER. Now do I understand you to say you still are looking forward to a still lower price of about $60,000 when you get into more production?

Colonel PETROLINO. Yes, sir. There are three productions we are speaking about.

(Discussion off the record.)

Mr. SCRIVNER. I suppose I should ask General Reeder again if you are going to buy the same number and curtail the funds on some less important program; what would you now consider the less important program?

General REEDER. If the price does not reach the lower figure which we hope, as a normal thing we would buy fewer, utilizing the money originally set aside, and only if there were exceptional reasons and we could find something which we could postpone or diminish, would we buy the same number.

Mr. SCRIVNER. Something for which you know we realize there is an absolute need and you can come back for and we will have to furnish the money?

General REEDER. There will be an absolute need for everything we ask for; otherwise we should not be asking for it.

Mr. SCRIVNER. Yes; but you know we are softer on some things than we are on others.

(Discussion off the record.)

PROPOSED NEW UNIFORM FOR THE ARMY

Mr. RILEY. The committee will be in order.

Mr. SCRIVNER. Mr. Chairman, before resuming with the justifications, I have a request I would like to present to General Decker or General Moore and ask that they supply the committee with the information thereon.

My attention has been called to the fact that the Kiplinger Washington Letter of February 23 stated that the Army was to procure a new uniform and that the approximate cost of this program was $3.5 billion.

A request has been made to the Secretary of the Army, Mr. Pace, for information on this matter by Representative Smith of Wisconsin, to which request no reply has as yet been received.

I had heard some reports of this, but I have not seen the Kiplinger newsletter. I think if there is anything like this in the air, this committee should be fully advised, because it is quite apparent that had it not been for the demands for uniforms brought on by the Korean war, we would be holding the sack for a considerable number of OD uniforms, due to the change made by the Air Force.

Either General Decker or General Moore should supply some information on this.

General REEDER. I think I can answer that right now without going any further, Mr. Scrivner.

Mr. SCRIVNER. Very well.

General REEDER. The Army considered a gray-green uniform and bought enough of them to try out, to see what the audience reaction was, by using it on the Third Infantry at Fort Myer. That test is not complete. In any case, there was never any plan considered which did not involve phasing out the old uniform and phasing in the new, without additional cost.

Yesterday morning the statement was made very definitely that in no case would there be a change in the uniform this year.

Mr. SCRIVNER. By whom was that statement made?

General REEDER. Mr. Pace, to me.

(Discussion off the record.)

GUIDED MISSILES NOT IN PRODUCTION

Mr. RILEY. Are there any further questions on the missiles we discussed this morning?

Mr. SCRIVNER. I have none at this time. We have that pretty well in mind.

Mr. RILEY. As I understand, these other missiles are still in the development stage; is that correct, General?

General CUMMINGS. They vary. Some of them are in very early stages of development. Some of them are further advanced. Colonel Toftoy could take up each one individually, tell you what its mission is and at what stage it is in.

Mr. RILEY. Are any of them ready for volume production?

Colonel TOFTOY. I can answer that this way, sir.

(Off the record.)

Colonel TOFTOY. In the research and development and the technical phases we do, with research and development money, make a limited

number of prototypes and the ones that seem very promising, the next batch of missiles will have let us say engineering service and troop tests and be produced with industrial-type funds.

The items in here are being budgeted at this time, because there is about an 18-month lead time, between the time money is available and the time the missiles come off the pilot line.

For this reason these missiles are subject to test. As you see they are in very limited numbers and include both the missiles and all the equipment that goes with them, which is necessary for tests leading up to an evaluation by not only the technical people but the field forces. And if proven satisfactory to meet Army requirements, then heavier production will appear in later budgets.

Mr. SCRIVNER. May I suggest that we start in on this list and have you tell us at the outset what is the approximate cost per missile, as well as the other equipment that goes with it, and also give us a general description of the missile itself?

Mr. RILEY. Yes; I believe it would be well if you could give us a short history of each one, and where possible, the cost of each missile and the cost of the equipment that goes with it.

(Discussion off the record.)

QUALIFICATIONS OF WITNESSES

Mr. SCRIVNER. When requests for funds are presented to the committee, there should be somebody present before the committee who can tell us the information as to exactly what the money is being asked for. If such person is not present, I think we should postpone that discussion until he can be available to the committee to give us the information upon which the figures in this request are based. While we are waiting for that information, the witness might proceed with a description of these missiles.

(Discussion off the record.)

Mr. RILEY. What is the purpose of the Ordnance Support Company equipment listed here as nine company sets at a cost of $6,000,000?

Colonel PETROLINO. They are the ordnance support units required to back up the tactical battalions in the form of assembly, maintenance, repair, and issue of missiles to tactical units.

Mr. RILEY. Will you have one company for every battalion?

Colonel PETROLINO. No, sir. The company probably would be broken up into platoons or sections, the section probably supporting one battery; or if you had a sector situation where you had three or four battalions, you might have a full company. It depends on the situation.

Mr. FLOOD. And they will be assigned by Army Headquarters, probably?

Colonel PETROLINO. Probably. I do not know.

(Discussion off the record.)

General CUMMINGS. This equipment, of course, would not become available until fiscal 1954.

Mr. FLOOD. When you refer to these nine companies, this is a new type of ordnance repair and maintenance unit?

Colonel PETROLINO. That is right.

Mr. SCRIVNER. In other words, you have it for artillery, you have it for infantry and have it for everything else, but this is a new-type

organization which will be used for the maintenance, repair, and issue of missile equipment, just as you have your artillery ordnance repair units?

General DAVIS. That is correct.

(Discussion off the record.)

Mr. SCRIVNER. In discussing these items set out on page 131 I presume, General, this should be a matter that is discussed off the record?

General DAVIS. I think so.

(Discussion off the record.)

WEDNESDAY, MARCH 12, 1952.

SAND BAGS AND BARBED WIRE

Mr. RILEY. Mr. Scrivner has several requests he wants to make for information.

Mr. SCRIVNER. Mr. Chairman, my attention has been called to a dispatch from Korea by Douglas Larsen, NEA staff correspondent, included in wich is a picture of part of the barbed wire now accumulated at the port of Pusan, and in the body of the article is this paragraph:

Already enough barbed wire has come to Pusan to make a double apron fence completely around the United States. Enough sandbads have been brought in to build a wall 2 feet thick and 4 feet high across the wastes of the Korean peninsula.

I am requesting the Department to advise this committee as to the accuracy of that report in view of the situation that has developed in barbed wire, where the farmers of America have been hard put to get that which they need for their own fencing. It would seem, if this article is true, that there has been some overprocurement, and if there is that much wire there and its use cannot be definitely proven, I think remedial steps should be taken.

(The information requested is as follows:)

In order that you may better visualize the tremendous quantities of sandbags and barbed wire required by our fighting forces in Korea, I will briefly outline the broad requirements and usages of these items.

The establishment of a stable defensive position for the seven United States divisions fighting in Korea required 71,400 reels of barbed wire. It is known due to the tactical necessity, that there are now in existence across the Korean Peninsula several such permanent defense lines.

The large number of additional temporary defense positions which have been established in the seesaw Korean campaign are estimated to have required an additional 375,000 reels. Over 750,000 reels of barbed wire have been required for the defensive lines in Korea to date. This quantity represents over two-thirds of the total amount of barbed wire requisitioned by our forces in the Far East command. Large quantities of barbed wire are also required in Korea for the construction of POW enclosures and for fencing of depots and supply points in order to prevent pilferage of stocks. In addition, theater stock levels must be maintained to insure prompt supply of operational requirements.

Sandbags are being used in Korea for numerous construction and repair purposes, due to military necessity. For example, many bridges have been constructed with long causeways made of sand bags filled with dirt. A typical example of the many bridges of this type is the one which was built across the Naktong River at Waegwan. This bridge consisted of a sandbag causeway approximately 1,500 feet long, 8 feet deep, 20 feet wide at the top, and 40 feet wide at the bottom. The constuction of this causway required the use of approximately 1 million sandbags. In addition to requirements for construction

of this type bridge, sandbags are also utilized for gun emplacements, trenches, shelters, revetments, demolition purposes, and other tactical needs. The quantity of this item requisitioned by the Far East command to date is approximately 112,000,000 bags, including requirements for theater stock levels.

It must be borne in mind that once items such as barbed wire and sandbags are installed, they are rarely recovered under combat conditions. For example, as our combat troops advance, emplacements are left behind and new installations are set up at their new positions. On the other hand, in the event of a withdrawal the installations are either destroyed or abandoned. In either case, you can see that the expendability of these items would be enormous.

Consequently, I believe that the quantities of barbed wire and sandbags requisitioned by the Far East command and shipped from the Continental States are thoroughly justifiable.

(Discussion off the record.)

NEW EXAMINING STATIONS

Mr. SCRIVNER. The other request relates to an inquiry made by another Member of Congress in which he states that he has received a report to the effect that some 79 new examining stations are now in process of being set up, 75 in this country and 4 abroad, calling for personnel of 290 officers and 1,503 enlisted men in connection with recruiting. This involves an expenditure by the Navy for its share of the undertaking of a million dollars and by the Marine Corps of $800,000. He does not know what the contribution for the other contributing services amounts to. He says the centers are for the purpose of physical, mental and psychological tests with a view to equalizing those receiving the same ratings between the several branches of the service. He also says:

It involves extensive costs, I think, in addition to those referred to, because of the necessity of transportation from the recruiting station to the examining station and back again, and provision for maintenance overnight, and so forth. The Navy indicates, off the record, it has always given IQ tests in recruiting stations and is getting no better material from the new set-up. The Marine Corps indicates, off the record, it has resulted in a decrease of physical standards for them.

He is raising the question of the authority and practicability of the establishment of 79 new stations without any information thereon being given to Congress, and he feels the proposed program has little if any merit in comparison with the added cost.

Is there any money in the Army's proposal before us to be transferred to the Secretary of Defense in relation to a program similar to this, or in connection with recruiting?

General DECKER. There is some money in our budget for the Army's share of the cost of operating the Armed Forces examining stations. I will furnish the information for the record.

Mr. RILEY. General, the committee would like to have the information requested by Mr. Scrivner for inclusion in the record.

(The information requested is as follows:)

Question. Why do we need the 79 Armed Forces examining stations in the recruiting services?

Answer. In order to implement the policies prescribed by the Secretary of Defense for the program for qualitative distribution of military manpower, it was jointly agreed by the armed services that it would be necessary to establish joint examining facilities to:

1. Accomplish the mental and physical examination required for both applicants for enlistment and registrants liable for induction.

2. Provide the Department of Defense with statistical reports of accessions for each of the armed services in order to maintain effective control of the program of qualitative distribution.

The armed services with the Department of the Navy as the coordinator, was directed to conduct a site survey of the locations at which our Armed Forces examining stations would be established. Primary consideration was given to the following requirements:

1. Armed Forces examining stations were to be established at existing Army-Air Force, Navy, Marine Corps recruiting main stations or other installations.

2. The stations were to be established where adequate facilities existed with due consideration given to proximity of adequate board and lodging, suitable transportation, central location, and utilization of rent-free space.

As a result of this site survey, the armed services, together with selective service, jointly agreed upon 79 locations as being the minimum number of stations necessary for proper conduct of the program.

It is interesting to note that the Army-Air Force were, at the time of the site survey, conducting mental and physical examinations for both enlistees and inductees at 103 locations, the Navy at 43 locations, and the Marine Corps at 43 locations. This reduction from 189 to 79 stations where physical and mental examinations are now conducted, has resulted in a tremendous saving. The only additional costs resulting from the establishment of the Armed Forces examination stations program can only be due to slightly increased administration to provide for standardized procedures for examination and to provide a system for statistical reporting.

Question. How much money is in the fiscal year 1953 budget for operation of AFES?

Answer. In the Department of the Army project 1900 (recruiting), an estimated $1,266,350 is requested for operation of AFES. In project 1640 (medical services at other Army facilities) an estimated $10,121,000 has been requested for medical examinations incident to operation of AFES. Of this amount $4,754,000 is reimbursable from the Navy and Air Force, leaving approximately $5,367,000 directly chargeable to the Army. Estimates concerning rental of building or office space, operation of vehicles, communications, meals and lodging for examinees are not susceptible of breakout to AFES functions, since the other functions of enlistment and induction are accomplished at the same location For this reason an attempted breakout has not been included.

PROCUREMENT INSPECTION CHARGES TO OTHER SERVICES

Mr. SCRIVNER. Another inquiry of a general nature relates to the method of charges by the Army against the Army, Navy, and Air Force in connection with the inspection items of ordnance and electrical equipment. The situation as presented by this Member of Congress indicates that the practice has grown up of having the Army make these inspections and not at the factories but at other points, probably points of distribution, and that there is a 3-percent charge on ordnance and a 10-percent charge on electrical equipment. If we can, I would like to have some information on that.

(The information requested is as follows:)

The Department of the Army is operating, insofar as charges for procurement inspection services on single department purchases assignment items are concerned, in accordance with the policy set forth in the armed services procurement regulations, which is as follows: "The Purchasing Department will bear, without reimbursement therefor, (*i*) the administrative costs incidental to its procurement of supplies and services for another department, and (*ii*) the cost of such inspection as it may perform in connection therewith * * *."

With regard to charges for procurement inspection services performed by one military department for another on items that are being procured by the department being serviced, the general policy as established in the Armed Services procurement regulations, is as follows: "* * *. Except as may be mutually agreed to by the departments concerned, each department shall bear the cost, without reimbursement, of such inspection as it may perform for itself or any other Department." Currently there are no agreements whereby charges are

made for procurement inspection services on ordnance and electrical equipment, as such, which are performed by the Department of the Army for another military department.

In certain instances where supplies are transferred on a reimbursable basis, however, charges are made to cover the costs of packaging, handling, etc., and it might be considered that inspection is a part of the charges. Such inspection charges would be a minute part of the over-all charge since the inspection services involved are those incidental to the depot operations of packaging and handling and are not as detailed or as expensive as the inspection made at the time of procurement. Procurement inspection costs average, in the case of the Army, approximately 1- to 1½-percent of the cost of the supplies that are inspected.

Mr. RILEY. What is the first item to be taken up this morning?

General REEDER. Before proceeding with the justification of the estimates, I would like to bring up something on which I think I need help from the committee.

(Discussion off the record.)

Mr. RILEY. Now what is the first project?

General REEDER. We left off on guided missiles yesterday with one thing to cover, and General Mickelsen can be up at 2 o'clock this afternoon to discuss that. I would like to go ahead with the ammunition where we left off the other day, if I may.

CORRECTED AMMUNITION CONSUMPTION ESTIMATE

We have gone over the rounds of ammunition as presented the other day, and we have examined the savings. I might go over this sheet to try to illustrate what we have done.

We have shown the item on the left; next the 1952 consumption as calculated; then we have made a correction for the next 6 months. This column "Corrected consumption for 1952" is the experience data for three quarters and the calculated consumption for one quarter of 1952—for the last quarter.

Then in the next column we have shown the savings in rounds which are created thereby; in the next two columns is the old net requirement and the adjusted net requirement because of those savings and then the amount that is in the 1953 budget and the amount that is unbudgeted. Then we have shown the total war reserve required for the particular round and the percentages for reserve either budgeted or unbudgeted. Then we have some remarks to try to explain our proposed actions.

We have shown the quarterly rate of consumption in Korea if full combat is resumed, at the calculated rates, and the production rate which we have scheduled for fiscal 1953 and extending sometimes into 1954. Then we show the proposed cut in the quantity in the budget which we suggest because of the savings made, and the corresponding funds, which is approximate, because we would have to get a little more accurate figure from Ordnance. For example, in propelling charges, the green bag and the white bag cost is a little different, and in the budget is an average price rather than an exact one.

(Discussion off the record.)

Mr. SCRIVNER. General Reeder, this is in answer to our request earlier in the week that you review some of the situations that the committee discussed with you relative to the proposed ammunition procurement program under the 1953 funds. It now seems that there can be some modification and in some instances considerable savings.

At this time, you are giving the committee revised figures on your ammunition requests?

General REEDER. Yes, sir. I have submitted for the benefit and use of the committee a classified document setting forth certain reductions which I believe can be made with reasonable safety and proper economy.

Mr. SCRIVNER. That is the information that we now have before us on the yellow sheets?

General REEDER. That is right.

ARMY PROCUREMENT FOR MDAP

Mr. SCRIVNER. In connection with one of your other programs we have discussed at various times the tie-in between Army procurement and the procurement required under MDAP funds—I believe it is now called Mutual Security?

General REEDER. That is correct.

Mr. SCRIVNER. That is, what we now call the Mutual Security Program. Of course, the Mutual Security people appear before another subcommittee on appropriations and present a certain program much of which must be administered by the Army but, from reports we are now getting from various sources it appears that the Mutual Security Procurement Program possibly will not be put into effect as proposed last year.

For instance, in the item of tanks, the Army has a tank procurement program which was to be handled in coordination with the proposed Mutual Security Program.

In order to have an orderly procurement program, to keep the factories and plants where the tanks and their parts are being manufactured, running in a rather orderly and economical way, what will happen to this program if the plans for procurement under Mutual Security are reduced? I am thinking particularly now of the Army's tank procurement program.

General REEDER. Either the Army must readjust its program, cut out something to make more funds available to the tank program or the production lines on the tanks would suffer.

Mr. SCRIVNER. In other words, if Mutual Security funds are not used for the procurement of tanks to keep going this orderly economic process, it will then be necessary for the Army to step up its tank procurement program in order to keep the plants operating in a regular and economical manner?

General REEDER. That is right, sir.

Mr. SCRIVNER. If that is necessary, will that in itself push your procurement program beyond the immediate needs of the Army? In other words, will we be required to use some money to keep the tank lines going?

General REEDER. No, sir; it will not go beyond our requirements for the active Army and Reserve.

Mr. SCRIVNER. So that even though we may have to go into a procurement program for the Army which exceeds the present suggested program, it will not in any sense of the word be a waste of funds or a use of funds merely to keep the tank lines rolling, but will be merged into a program of present and future needs?

General REEDER. Yes, sir.

(Discussion off the record.)

DISPOSITION OF CERTAIN WORLD WAR II EQUIPMENT

Mr. SCRIVNER. The question has arisen in the minds of many during the discussion of these requests for equipment and ammunition as to what happened to a great deal of similar equipment that we had for a much larger army at the end of World War II.

For instance, if my memory is correct, we had 14 or 15 armored divisions in Europe. We had 16 to 20 tank destroyer battalions, which had 76- and 90-millimeter guns and armor-piercing and other ammunition. Many of us have been told by officers who were in charge of some of these units that, in compliance with instructions, they merely parked their vehicles, turned in their ammunition and they and their units proceeded home.

For the enlightenment of this committee and for the record, if any of you gentlemen here present know, it is requested that you give us a fairly comprehensive picture as to what happened to these various items of equipment.

(The information requested is as follows:)

The equipment left from World War II was scattered over the face of the globe, much of it in inaccessible spots. Some of it was almost worn out and some of it was new. The progress in manufacture of many items during the war has been such that armament produced early in the war had been rendered obsolescent by that which was manufactured toward the end of the war. There were supplies of a perishable nature which did not lend themselves to long term storage; there was a great deal which could be adapted to use in civil life and consequently was in demand to aid the reconversion to a peacetime economy. To complicate the problem still further, the haste of the demobilization deprived the Army of the men whom it had trained to account and care for this vast matériel.

The total matériel was far too great to store for any period of years. Therefore the Army made a careful decision. This was to retain that equipment which was of modern design and had not already been made obsolescent by progress during the war, to retain only equipment which could be stored over a long time at low storage cost, to prefer equipment in good condition to worn equipment when the total of a given item appeared too great for storage possibilities, to return to the civil economy quasi-commercial items in excess of the Army's current needs.

Overseas commanders were instructed to keep a reserve adequate to maintain the forces expected to be under their commands for a period of 5 years, to return to the United States all of the selected items above that reserve supply, and to dispose, through the Foreign Liquidation Commission, of the balance. This policy was in line with the thinking of the Congress and our civil leaders at that time. Indeed, the Army was under great pressure to effect rapid disposal of its "surpluses."

In the absence of its trained maintenance and supply men, and with limited funds, the Army set about painstakingly inventorying its residual stocks, concentrating them into areas where there was skilled labor available and beginning the repair of worn or unserviceable equipment. Equipment was returned to the United States in great volume. Because of the eagerness of the troops to be demobilized, that which they had packed up before running for the ships had been done poorly. The markings of the boxes indicated truly neither the contents nor the condition of the contents. All of these returns had to be gone over, checked, classified, and processed or repaired. This work has proceeded steadily and it accounts for the fact that when we landed in Korea, there were good stores of World War II equipment ready to use and there were in existence overhaul facilities such as the Big Five in Japan and the ordnance shops of this country and Europe which could back up the troops.

What has become of all the equipment left from the war? We kept the peacetime Army in equipment with it for 5 years between World War II and Korea; during that time our procurement of matériel was barely perceptible. We began and are continuing the arming of our allies and friends through the Mutual Security Program with this equipment saved from the war. But most important

of all we have fought for 20 months in Korea almost entirely with that legacy of equipment which the Army preserved. In this appropriation alone, the lost or wearout of equipment in Korea in fiscal year 1952 is estimated at $2½ billion worth. The loss in fiscal year 1951 was nearly as much and for the 2 years nearly all of it was World War II equipment and amunition that the Army had saved. Don't forget that at the end of this fiscal year, the forces in Korea will still be armed on the whole with World War II equipment.

That gives you an idea of what has become of the World War II equipment. If it had not been carefully preserved, inventoried, and used, we could not have fought in Korea. In spite of the billions which you have appropriated, American industry has been able and willing to produce for the Army in the 20 months since Korea began, only a small fraction of the warlike stores which have been used in Korea. In short, the Army saved all that it could with its resources, from the debacle of the demobilization and it has used that with excellent results.

Mr. SCRIVNER. General Cummings, I understand that you were an ordnance officer in France and Germany at the end of the war. Did you have any personal contact or experience with these weapons and munitions after the war?

General CUMMINGS. Yes, sir; I did.

Mr. SCRIVNER. Would you enlighten the committee for the record by giving us a statement on what was done with that equipment?

(The information requested is as follows:)

The problem of receipt, classification, storage and disposition of the vast quantities of matériel turned in by departing units from the European theater had been anticipated but, in view of the accelerated redeployment of troops, the scope was greatly increased over that originally contemplated. The turn-in was implemented by providing all units with designated points at which they would turn in certain specific types of matériel.

The intensive use, by Ordnance, of the industrial facilities in France and Belgium for rebuild of ordnance matériel, prior to cessation of hostilities, placed us in a position of having suitable turn-in points for some of the equipment and these facilities were designated as receiving points for specific types of matériel. Shipments of the equipment were made by truck or by rail and Ordnance officers at the facilities involved assumed responsibility for the equipment. As an example, the Fabrique Nationale in Liege, Belgium, received, preserved, and shipped to the United States millions of items of small arms matériel such as the M1 rifle. Another example was the use of the locomotive facilities in and around Strasbourg, France, for the receipt, preservation, packaging, and shipment of artillery matériel. Equipment such as combat vehicles and motor vehicles were delivered by the units themselves, overland, to selected points in France and Germany, where they were received by Ordnance units at those points. The practically complete absence of hard standing and total absence of overhead cover made it necessary to park this equipment in the open. Full use was made of indigenous personnel to augment Army resources. The storage conditions, combined with the shortage of trained personnel, resulted in considerable deterioration of the matériel in open storage.

After the initial job of receipt and classification was accomplished, the task of returning to the United States those items of matériel which were desired for retention was undertaken. With minor exceptions, no transport vehicles were scheduled at that time for return to the zone of the interior. These vehicles were used to sustain the operation of American forces remaining in Europe, utilizing German facilities to the maximum for rebuild of this equipment; those not needed for this purpose were disposed of through the Foreign Liquidation Commission.

In general, for all classes of matériel the theater requirement were computed and the remaining serviceable and repairable were reported to the zone of interior for disposition instructions. Upon advice of the items and quantities not required for Department of the Army needs, action was taken to effect disposition through the Foreign Liquidation Commission.

The extensive rebuild program carried out in conjunction with German facilities and indigenous labor involved not only complete items such as trucks, but included vehicle components such as engines and axles and was a source of supply of matérial to maintain our forces in Europe.

The problem of returning the equipment to the United States was one of considerable magnitude, and upon my departure in 1947 it had not yet been fully completed.

With respect to ammunition, units turned in their basic loads of ammunition to Army supply points and ordnance depots in France, Belgium, and Germany. The supply points were cleared by Ordnance by shipment to depots. These depots were gradually cleared out and consolidated by movement of reserves to established permanent depots in Germany that were designated to store the ammunition for support of the occupation forces and shipment to the United States of serviceable and unserviceable reparable items of a nature required for Department of Army needs. Items that were excess to all known United States Army requirements were disposed of through the Foreign Liquidation Commission.

The shortage of experienced personnel was felt in ammunition activities in the same degree as expressed before in connection with other matériel.

EFFECT OF KOREAN SITUATION ON AMMUNITION REQUIREMENTS

Mr. SCRIVNER. Most of the new figures that we have been given have had taken into consideration the actual situation now existing in Korea, is that correct?

General REEDER. That is correct.

Mr. SCRIVNER. If a truce is reached there, there would be a change in some of the computations. Of course, if a truce is not reached and the fighting in Korea picks up again in tempo and intensity, there will be a need for you to appear before us and step up your request for ammunition in view of the increased demands arising out of that situation?

General REEDER. That is correct.

Mr. SCRIVNER. So that this picture is painted now as best you can from present actual conditions?

General REEDER. That is correct. We have reflected the first three quarters from actual experience.

Mr. SCRIVNER. The first three quarters of fiscal 1952?

General REEDER. Yes; and only the last quarter would affect the statistical computation, because we have nowhere shown any combat in fiscal year 1953.

Mr. SCRIVNER. Nevertheless, if the tempo should be stepped up, undoubtedly there would be a need for more ammunition which, in turn, would bring about a need for additional appropriations?

General REEDER. That is right, sir.

Mr. RILEY. These appropriations are based upon actual conditions existing now and you would have these same requirements if a truce were declared in Korea, is that right?

General REEDER. That is right. There would be very little difference.

Mr. RILEY. General, is it possible in the production lines of the various ammunition items noted on this classified document, to transfer the activities of one production line to another, or the personnel connected with one production line, or more, of these items, to other items? In other words, if you have a sufficient quantity of a certain item can you transfer the activities there to another item in order to bring that other item up to your requirements?

General DAVIS. I can answer that question best, Mr. Riley, by giving you a brief description of the ammunition industry which is now in being. From that description, I think you will get a very good idea

of the flexibility we have, both as to raising or lowering the tempo of production, and as to shifting from one ammunition type to another as combat requirements may dictate.

There are three parts to the job of producing artillery ammunition or mines or grenades or aircraft bombs:

1. Procurement of the metal parts, that is, shell, cartridge cases, metal parts of fuzes or boosters, bomb bodies, and so forth.
2. Manufacture of the required explosives and propellants.
3. The loading and assembly operations.

The last two of these are carried out almost entirely in Government plants, and almost entirely by assigned contractor operators. The plant capacity in the commercial powder and explosives industry is tiny compared with that of the Government plants. Small arms ammunition is made in Government plants for a similar reason. Members of this subcommittee have interested themselves for the last 5 years in the standard of maintenance appropriate to the plants held in stand-by status. They constitute a priceless investment. The loading and assembly operations do not have even a remote counterpart in commercial enterprise. All of the manufacture and operations in the Government plants admit considerable flexibility both in rate and in type of ammunition being produced.

There is less flexibility in the procured metal components. As you know, we have in the past depended mostly on the private metal working industry of the country rather than on Government-owned plants for these items. However, the conversion of any kind of private plant to the production of a fuze or a projectile is a disrupting thing, even when we may have in Government storage the needed types of machine tools which the private contractor does not usually have.

I would like to say something at this point about the quality of our metal component producers. Most of them are today making the same item or one closely similar to what they made in World War II. Most of them were allocated by Munitions Board action before Korea to make just those items for us. Most of them are not big companies. The majority are fairly small companies that specialized during the war and concentrated their capacity and production knowledge on the output of a particular projectile or other component. Since there were seldom other claimants than the ammunition people for the capacity of these plants in a future war, they were allocated to us quite early in the planning process several years back, and they knew in large measure just what we would expect them to make, and could plan on it. Varying degrees of opportunity for advance planning in peacetime, plus a large amount of residual experience in the organizations of the contractors, have been an asset of no mean value. It accounts to a great extent to some of the surprisingly good prices we are getting today on ammunition components almost across the board. Those prices are not based on ignorance. They are the result of exact knowledge and experience on which the contractor can rely with confidence. On one important fuze today we have 22 contractors. It is not an easy item, but 16 of them made the same fuze during the war. The other six made fuzes of some other kind. I am proud of this whole group of metal component contractors. There are at least 200 of them, scattered widely over the country.

Mr. Flood. I would like the record to show that if and when this subcommittee sees fit to make any cuts in the requests for appropri-

ation with particular reference to ammunition, that such cuts, if made by the subcommittee, will have been made only after a very detailed and extensive examination of Budget and Ordnance witnesses, caliber by caliber and item by item.

Mr. RILEY. This classified document which has been furnished at the request of the committee contains a very detailed analysis of the present ammunition situation and the requirements which are needed to bring this position to a reasonably safe status, and is of tremendous benefit to the committee. It will enable the committee intelligently to analyze the necessary requirements and reach a conclusion based upon the facts presented, in keeping with the safety of the program.

General REEDER. I might add that we shall be available at any time you wish to consult us regarding any of the details.

Mr. RILEY. Thank you.

ARMY AIRCRAFT

Mr. RILEY. What is the next program, General?

General REEDER. We would like to go now to the airplane program.

GENERAL STATEMENT ON AIRCRAFT PROCUREMENT

Mr. RILEY. We should be glad to have a general statement from you, General, if you have one to present.

General REEDER. The Army aircraft program for fiscal year 1953 consists of only two aircraft items and represents the minimum requirements of the peacetime elements of the Army; absolutely no provision is being made for war reserves of these items.

This program has been fully coordinated with the Office, Secretary of Defense, and the Air Force, not only from a production viewpoint, but principally to insure no duplication in the intended use and deployment of this type aircraft.

War reserves of these aircraft are not being procured at this time primarily due to the limited production capabilities of the industry. Our experience in Korea, which has proven this type aircraft invaluable in saving the wounded and flying supplies to isolated units, will provide the Army with the information which is necessary for a proper evaluation of our war reserve requirements. However, even if these requirements were now known, they could not be produced and our reserves must await later funding.

AIRCRAFT FOR ARTILLERY SPOTTING

Mr. FLOOD. With reference to the language in your statement: "invaluable in saving the wounded and flying supplies to isolated units," what about your artillery squadrons? Are they not Army?

General REEDER. They do not use these particular planes.

Mr. FLOOD. It is Army air, is it not?

General REEDER. Yes, sir.

Mr. FLOOD. Then why are you so peacefully inclined, in this document? Certainly an artillery spotter is not using a combat plane. Whether he is armed or not is his business.

General REEDER. The planes are not armed. And also it happens that there are none of that type in this budget.

Mr. FLOOD. That is, in this request?

General REEDER. That is right.

Mr. FLOOD. That is just fortunate. But you are not going around masquerading that the Army air arm is a noncombat unit?

General REEDER. Not entirely.

Mr. FLOOD. Well, it is an absolute term; it is or it is not?

General REEDER. You have a defenseless man up there.

Mr. FLOOD. That does not determine whether he is combat or not.

General REEDER. No.

Mr. RILEY. I think it would be well to have for the record a statement of the Army's air program in general terms. Will you give us such a statement, General?

General REEDER. The Army uses planes within its forward combat elements. For example what we call the liaison plane, a two-seater, is used for artillery spotting and for close-in reconnaissance by the artillery or by the infantry. It is using many of the four-place short-range jobs to move the staff around quickly in the combat area.

Then we are going to the helicopter.

Mr. FLOOD. Before getting to that, you have planes assigned to army and corps and in some cases divisional commanders, do you not?

General REEDER. That is right, sir, of this type.

Mr. FLOOD. That is Army air?

General REEDER. They will be Army planes; yes, sir. When one of those gentlemen has a long trip to make he will ask for the proper type of plane from the Air Force to fly him.

Mr. FLOOD. But for his own purposes the army and corps and in some cases division commander has his own plane and pilot, which is Army Air?

General REEDER. That is correct.

Mr. SCRIVNER. Used exclusively by the corps and himself?

General REEDER. No, sir; usually it is not assigned to him.

Mr. SCRIVNER. In other words, it is a multiple-purpose plane?

General REEDER. That is right.

Mr. SCRIVNER. It is not set aside exclusively for the division CO and stands by him for when he needs it?

General REEDER. You are correct.

Mr. SCRIVNER. When he does not use it, it is used for some other purpose?

General REEDER. That is correct.

(Discussion off the record.)

Mr. FLOOD. With reference to these two types of planes that are mentioned in the justifications, let the record show that they are in the nature of Beechcraft planes. People who read the record will understand better what a Beechcraft is, and may not understand the significance of the letter and number designation.

Mr. VICK. An L–23 is a Beechcraft.

Mr. SCRIVNER. What is the L–20?

Major SULLIVAN. A DeHaviland five-passenger plane.

HELICOPTERS

Mr. RILEY. Will you give us a short statement on the helicopters?

General REEDER. We are turning to the helicopter for two purposes; one is a utility job, with small cargo capacity, for evacuating

wounded and similar jobs, where it has proved to be invaluable in Korea. Again, in the larger carrying capacity helicopter, which is relatively new, we expect to equip some transportation companies for purely tactical use with them. Air transportation can be effected by that means, where it could not be effected by ground transportation or could not be effected as quickly by ground transportation.

Mr. FLOOD. General, before going into details on your program, I want to direct your attention to the second paragraph of your statement. I think it is important for the record to show that you state there that:

> This program has been fully coordinated with the Office, Secretary of Defense, and the Air Force * * *

Are we to understand that the request for appropriation for the Army Air arm and the type of plane to be used by the Army Air arm and the purposes for which they are to be used, have been fully and completely understood by the Office, Secretary of Defense, and by the Office of the Secretary of Air; and do we understand that General Collins and General Vandenberg are in complete agreement with the budget people on this?

General REEDER. And you may add the two service Secretaries, too.

Mr. FLOOD. What is the answer to my question?

General REEDER. The answer is "Yes." And you may include the two service Secretaries as among those in full agreement.

Mr. RILEY. Are these helicopters used to any extent in supplying troops in areas where they are cut off in combat?

General REEDER. That is one of the features where we think they will be most useful, the ability to bring supplies to or reinforcements to an isolated unit.

They have another possibility. We can get on the other side of the river in a number of ways. One by an air drop of troops. Another is to go across by main strength and build a bridge. But there is the possibility that while either method is being employed you could resupply the people on the far side or reinforce them with helicopters and thereby save a situation which might be lost otherwise.

Mr. RILEY. Will you give us information on the carrying capacity of the helicopters?

Mr. VICK. This is broken into two types. One is a 10-passenger Sikorsky, H–19, and one is a 20-passenger, the Piasecki.

General REEDER. What is the cargo-carrying capacity?

Mr. VICK. The cargo capacity would be rated at 4,000 pounds for the H–21 and 2,000 pounds for the H–19.

General CUMMINGS. The helicopter type includes both the H–19 and the H–21 and the average price is indicated in that entry.

USER TEST ITEMS

Mr. SCRIVNER. Which is the $600,000 job?

Mr. VICK. The user test item represents a family of aircraft items, items which we may buy in succeeding years, if they look promising.

Mr. SCRIVNER. How will this job be referred to?

Major SULLIVAN. It will not be numbered until it has a model designation in the mock-up.

Mr. SCRIVNER. Who is going to use it?

Major SULLIVAN. That is undetermined, too.

Mr. SCRIVNER. What will be its capacity?

Major SULLIVAN. That will be determined by its mission, cargo, or utility.

Mr. SCRIVNER. What will be its cargo capacity?

Mr. VICK. One example of such an item would be the new Sikorsky, which is a 40-passenger-carrying helicopter.

Mr. SCRIVNER. Is that this $600,000 item?

Mr. VICK. It might or might not be.

Mr. SCRIVNER. In other words, you do not know what this is going to be yet?

Mr. VICK. Whatever looks the best at the time the procurement comes up.

Mr. SCRIVNER. Is the same true with reference to the $90,000 job?

Mr. VICK. The same is true I believe with all of these service-test items.

Mr. RILEY. What is the catapult equipment used for, General?

General CUMMINGS. That is the OQ–19 which is an aerial target launching. That is the supporting equipment for it.

Mr. RILEY. Do you use that because you have no runways?

General CUMMINGS. That is right. They are catapulted from a relatively simple fixed catapult.

Mr. RILEY. In a restricted area?

General CUMMINGS. No, sir.

General REEDER. The OQ–19 is a toy airplane that they have for the antiaircraft people to shoot at.

Mr. SCRIVNER. A drone target?

Mr. RILEY. It is just used to spring targets.

Mr. SCRIVNER. It is just a magnified trap; that is all.

Mr. RILEY. You have an item here, user test $3,525,000. That is to be used to test new planes that you propose to put into production at a later date?

General REEDER. That is correct; trying to see whether they justify production.

Mr. RILEY. To see whether they will fulfill the mission that you hope they will fulfill?

General REEDER. That is right. And in an industry as progressive as the airplane industry you have to keep trying out the new as it comes along to see whether you should not change.

Mr. RILEY. Is the Air Force testing similar types of planes?

General REEDER. Where we run into the same type, we arrange for joint tests.

General CUMMINGS. Yes, sir. These are all procured through the Air Force.

Mr. RILEY. There is no duplication of testing of these models?

General CUMMINGS. Originally they are tested jointly with the Air Force and the Army. These particular items, after proceeding through the engineering test, which is normally a joint test, would then be used in most cases at Fort Bragg with our field force board at that location.

General REEDER. They will make a flying test, you might say, with the Air Force and then when it comes to the observer who is to work in it, that we would do down at Fort Bragg, to find out whether an

artillery man who has to lean out—how much he has to lean out, whether he can see, whether the plane goes too fast for him to see, and that sort of thing. It does not involve any duplication.

Mr. RILEY. In other words, you think that the usage by the Army is sufficiently different to make this program necessary over and above the program that the Air Force has?

General REEDER. Yes, sir. Their interest in this type of aircraft is very small.

Mr. RILEY. What is the lead time on these two types of aircraft?

Mr. VICK. The Air Force gives a lead time of 18 to 24 months on the transport helicopter, and on the fixed-wing they give us a lead time of 12 to 15 months.

Mr. RILEY. How many do you have on order now out of 1952 funds?

General REEDER. We would have them on order from 1951 and 1952.

Mr. RILEY. The lead time is so great that these originate back in fiscal 1952?

General REEDER. They were ordered right at the end of the year. The order was placed in May, if I remember correctly.

Mr. VICK. What is shown here is 236 of the fixed-wing and 182 of the rotary-wing type.

Mr. RILEY. Do you have actual contracts for the production of those planes, or are these just funded?

General REEDER. We sent the money to the Air Force who make the contract. They buy them for us. We have 236 of the L–20 and L–23 types on order from 1951 and 1952 funds, and 182 of the transport helicopters.

Mr. VICK. Presently we are receiving L–20's and we are expecting to receive H–19 helicopters in May and June of this year.

Mr. RILEY. Did you have any of these specific aircraft prior to 1951?

General REEDER. No, sir, we had none of these types prior to 1951.

Mr. RILEY. 1951 was the year when you originated this?

General REEDER. When we began to revamp our Army air.

Mr. RILEY. What is the average life of these planes?

Mr. VICK. About 5 years.

Mr. SCRIVNER. While these are new types, you did have your L–5 and your L–7, your observation-type planes that you normally refer to as Cub-type planes; is that right?

Mr. VICK. Yes, sir. The Cub was an L–4. The L–5 was a Convair.

Mr. SCRIVNER. Of course, the distinction for the average person is so small that it is not worth worrying about.

Mr. VICK. Yes, sir.

Mr. SCRIVNER. But those have been replaced now in later months by your L–17?

Mr. VICK. Partially by the L–19.

Mr. SCRIVNER. Now you are going into the L–20 and L–23?

Mr. VICK. Which replaced the L–17.

ARMY PLANES USED IN KOREA

Mr. SCRIVNER. What types are now being used by the Army air in Korea?

(Discussion off the record.)

Mr. SCRIVNER. You did not have those at the outset?

Mr. VICK. Yes, sir.

General REEDER. We bought those before 1951.

Mr. SCRIVNER. Very few.

Mr. VICK. Yes; very few.

Mr. SCRIVNER. What is the inventory in Army air now; how many are there of each one of those?

(Off the record.)

COORDINATION OF ARMY AIR OPERATIONS WITH AIR FORCE

Mr. SCRIVNER. As I understand it, in your maintenance and operation you coordinate to a fair degree with the Air Force?

General DECKER. Yes, sir.

Mr. SCRIVNER. Is the same thing true of training facilities and ground crews?

General DECKER. Yes; the Air Force has always provided basic training for Army pilots. While the Army was unable to furnish the necessary aircraft, we had to do some instrument training by commercial contract. We are getting back to the point where this training can be accomplished within military facilities.

Mr. SCRIVNER. Is the same thing true of the helicopter?

General REEDER. I think so, because there are relatively few.

Mr. SCRIVNER. In your maintenance and operation training, how is that done—along with the Air Force?

Major SULLIVAN. Yes, sir. We have a joint agreement with the Air Force school and Army school.

Mr. SCRIVNER. And Army school?

Major SULLIVAN. Yes. In fact, the Navy trains some, too.

Mr. SCRIVNER. That is one of the things we are trying to get around—the Army Air running its own training schools for lighter planes and helicopters.

Are they running their own schools for the instruction of their ground crews for maintenance and operation, or is that being done by the Air Force?

Major SULLIVAN. We have a joint school at the Air Force base at San Marcos, Tex., for training our pilots and mechanics along with the Air Force pilots and mechanics. Then we have a field training school to go into our fire operational training at San Marcos, Tex., only.

Mr. SCRIVNER. That is for the fixed-wing?

Major SULLIVAN. For the fixed-wing and helicopter.

Mr. SCRIVNER. All at the same place?

Major SULLIVAN. Yes, sir.

Mr. SCRIVNER. So that you are not operating any schools independently as Army Air until you get into the specific use that the Army has for these planes and helicopters?

Major SULLIVAN. That is correct.

General REEDER. Mr. Chairman, General Mickelsen is here in accordance with our understanding this morning.

Mr. RILEY. General Mickelsen, we are glad to have you back with us.

There are one or two items in regard to guided missiles that are a little disturbing to the committee.

(Discussion off the record.)

ITEM OF JOINT PROCUREMENT

Mr. SCRIVNER. May I make this suggestion, Mr. Chairman, following the suggestion made by General Moore that, in view of the discussion we have had here for more than an hour with General Mickelsen, it is apparent that we have come to the point where some decision must be made relative to this particular item. Therefore I think General Moore's suggestion is good, that we have Mr. Keller, accompanied by General Mickelsen, preferably, plus someone who can speak with authority from the Air Force come before us; and at the same time I would request that General Moore have for us through the Office of the Secretary of Defense a statement of the program of procurement for this item in the Air Force budget. Because, as we sit here now, we are working only on the Army budget and have no personal knowledge of any request made by the Air Force. Perhaps with those three gentlemen present and with the information requested, we may be able to arrive at some reasonable and logical decision.

(Discussion off the record.)

Mr. RILEY. General Mickelsen, we are very appreciative of your appearance before the committee.

General MICKELSEN. Thank you, sir.

ELECTRONICS AND COMMUNICATIONS EQUIPMENT

GENERAL STATEMENT OF THE DEPUTY CHIEF SIGNAL OFFICER

"Mr. RILEY. We are now to take up, under "Procurement and production," electronics and communications equipment. General O'Connell, we are glad to have you appear before the committee and should be glad to receive such statement as you care to make in regard to the Signal Service request for appropriations.

General O'CONNELL. Thank you, Mr. Chairman.

Project 1310 covers funds required for the procurement of major items of electronics and communications equipment required by the Army.

It includes $9 million for the transportation of this manufactured equipment from the factories to depots; $10 million for the procurement and service-test models of certain types and the remainder of $221,856,000 for the procurement of equipment.

I would like to include in the presentation and for your consideration two items in project 1210 which are noncombat special vehicles, the total amount of which is $2,748,000.

As was previously indicated in General Reeder's discussion, the Army is in the process of reprograming presently available funds with a view to making them stretch as far as possible.

In the case of the Signal Corps, of the 250 major items which appeared in our last budget, we are requesting funds at this time for continuing production lines on 33 items and for the initiation of new production on 6 newly developed items.

In effecting this reprograming it will be necessary to discontinue a considerable number of production lines. For example, on Spiral 4, one of our major items, we are going from six lines to two, from a peak production of 30,000 units per month to a steady-going rate of 6,000 units per month.

Mr. SCRIVNER. You did not have those at the outset?

Mr. VICK. Yes, sir.

General REEDER. We bought those before 1951.

Mr. SCRIVNER. Very few.

Mr. VICK. Yes; very few.

Mr. SCRIVNER. What is the inventory in Army air now; how many are there of each one of those?

(Off the record.)

COORDINATION OF ARMY AIR OPERATIONS WITH AIR FORCE

Mr. SCRIVNER. As I understand it, in your maintenance and operation you coordinate to a fair degree with the Air Force?

General DECKER. Yes, sir.

Mr. SCRIVNER. Is the same thing true of training facilities and ground crews?

General DECKER. Yes; the Air Force has always provided basic training for Army pilots. While the Army was unable to furnish the necessary aircraft, we had to do some instrument training by commercial contract. We are getting back to the point where this training can be accomplished within military facilities.

Mr. SCRIVNER. Is the same thing true of the helicopter?

General REEDER. I think so, because there are relatively few.

Mr. SCRIVNER. In your maintenance and operation training, how is that done—along with the Air Force?

Major SULLIVAN. Yes, sir. We have a joint agreement with the Air Force school and Army school.

Mr. SCRIVNER. And Army school?

Major SULLIVAN. Yes. In fact, the Navy trains some, too.

Mr. SCRIVNER. That is one of the things we are trying to get around—the Army Air running its own training schools for lighter planes and helicopters.

Are they running their own schools for the instruction of their ground crews for maintenance and operation, or is that being done by the Air Force?

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In general, moneywise, we will not gain toward the establishment of a reserve or increasing a reserve with these funds due to the consumption in Korea.

As an example of this, the requested procurement of field wire, 540,000 miles, is somewhat less than the estimated annual consumption for Korea.

The prices we have used in computing the requirements are in general the average contract prices of contract prices now in effect.

I have a chart, gentlemen, to show what we have done, the progress we have made in obligating our fiscal year 1952 money, if you care to see it.

This shows the effect of a slow start due to reprograming, the program, as a result of a continuation of the war in Korea into fiscal year 1952.

Following the reprograming operation we have started to get going here on our obligations and as of the end of January have obligated some 55 percent of our 1952 money as against a total elapsed time of 58 percent of the year. These are estimated accomplishments in obligation from here on [indicating on chart].

Actually in February we obligated $94 million as against a predicted $73 million. So that now as of early March we are some 70-percent-odd—67 percent of the time elapsed and will have no difficulty in accomplishing an orderly obligation program for the remainder of the year.

Of the items that we are carrying this year, the newly developed items, two of the most important ones moneywise are the new WO–1 field wire and our carrier telephone systems. I would like to explain the accomplishments that have been made in the saving of materials and money and the providing of more facilities with less utilization of manpower for maintaining the system.

This Spiral 4 carrier telephone system has no commercial counterpart. It replaces in the Army the construction of the open-wire-pole lines, which it took a company of men a day to construct 3 miles of.

This was developed just prior to and during the early days of World War II as a means of providing the Army with a rapidly constructed facility which could be kept up with the rapid advance of armies, corps, and divisions and with one cable. I have some examples of these cables here.

On one of these cables we are able to get 4 wires, 4 telephone conversations with our World War II system. With our new system that we are now procuring we are able to get on the new cable 12 conversations on the same 4 wires and actualy the wires have been reduced in size and the over-all cable has been reduced in size, with a reduction in materials of some 75 percent.

The numbe" of added stations along a sample length of such a facility, such as 120 miles, with the World War II system we had to have repeater stations every 20 miles. Along the line, with this new system, we have to have added stations only at 40-mile intervals, thus savings three-fifths of the requirements for added stations.

The over-all reduction in cost from equipment and material per circuit mile comes to about $110. Multiply that by 12 channels and by 120 miles and it comes to about $158,000 per 120-mile system.

As I say, this is one of the major items in this present budget, procurement of the new cable and of the terminal equipment and the repeater equipment which is used with it.

DISPOSITION OF OBSOLESCENT ITEMS

Mr. RILEY. What are you going to do with the old equipment—declare that surplus?

General O'CONNELL. No; we are just about out of the old equipment. We had 117,000 lengths of the old Spiral 4. They come in quarter-mile lengths. That was prior to Korea. During the fiscal year 1951 we used up 111,000 miles, 1,000 units, quarter-mile lengths and in Korea this consumption was 104,000.

(Off the record.)

General O'CONNELL. We are completely out of the old equipment and getting into production of the new. We have completely exhausted the old equipment.

DURABILITY OF NEW CABLE

Mr. RILEY. Can you give me some idea, in point of time, as to how long that cable lasts when it is in heavy use?

General O'CONNELL. I would say if it is left in place it will last for a long time. It would last for a matter of some years, but it is constantly being put up and taken down as the units move forward. It is recovered and used again and since it does receive much rough usage it does have a high rate of attrition.

General REEDER. Physical damage is what causes the trouble.

Mr. RILEY. I understand that. I just wondered if you had some figures on the life of this equipment when it is in field use and moved from place to place.

Mr. MONTGOMERY. The average life under combat conditions is approximately 4 months.

General O'CONNELL. Are there any other questions about this item, gentlemen?

COST OF IMPROVED CABLE

Mr. SCRIVNER. How much are you asking for this in the budget?

General O'CONNELL. There are four items that cover this. The cable is $11,771,000. The system's cost is $35,228,000.

General REEDER. On page 119 you will find a modulator.

General O'CONNELL. There is the TCC–7, $10 million and the TCC–8, the repeater.

Mr. SCRIVNER. About $35 million?

General O'CONNELL. Over-all for the systems.

Mr. SCRIVNER. Those four items go into a complete communications system of the spiral 4 cable?

General O'CONNELL. Yes, sir.

Mr. RILEY. Will this take care of your requirements for 12 months?

General O'CONNELL. This takes care of our requirements for the maintenance of the production-line considering the lead time. It will give us a running rate of 6,000 lengths per month.

Mr. RILEY. In other words, this is the minimum to keep your production going at the most economical rate in line with your requirements; is that right?

General O'CONNELL. That is right.

Mr. RILEY. What is the lead time, General?

General O'CONNELL. Nine months on this item.

Mr. SCRIVNER. Will this rate of production keep you current with your needs or give you a little spare?

General O'CONNELL. It will give us a little spare. We will get current with Korea at the end of April of this year.

General REEDER. When this is all delivered they will have about 20 percent of their war reserve?

General O'CONNELL. That is assuming Korea ends in June of this year.

WALKIE-TALKIE

This item is representative of the newer radio equipment and the improvements that have been made. This shows the combat soldier's walkie-talkie, his most important item of radio equipment, in which a weight-saving of half has been made, from 40 pounds to 20 pounds. The range has been increased from 3 to 5 miles and there is an increase in the number of communication channels from 40 to 170.

The cost figures given here is the World War II price. The present price index has not been included in this figure, but it would bring it up to 140 percent of that cost here. This is the average cost of the present production [indicating chart].

Mr. RILEY. The present cost is almost double?

General O'CONNELL. That is right, sir. Mr. Chairman, that concludes the general statement.

Mr. SCRIVNER. You are asking how much for that?

Colonel PENCE. The item at the bottom of the first page, PRC–10, $9,450,000; PRC–9, $927,000.

Mr. SCRIVNER. Why is one more costly than the other?

General O'CONNELL. It is figured on the basis of the contracts actually in existence.

Mr. SCRIVNER. Is there any difference between these two units in type?

General O'CONNELL. There is a difference. They have a different frequency band.

It is a question of quantity. We buy more of the Infantry set than of the Artillery set.

IMPROVED FIELD TELEPHONE AND FIELD WIRE

We have another item here of which I have an example with me, the new field telephone which effects a saving in weight of approximately 30 percent over its predecessor and will provide over 30 percent more distance, with this new field wire.

We are happy to have a new telephone ready to put into production, because we are just about out of World War II telephones.

Mr. RILEY. Is this the TA–3?

General O'CONNELL. The TA–43. We are also proud of some accomplishments that have been made in research and development. We figured out today that this field wire that we are estimating for 1953, if we had bought the old heavy wire it would have taken two more Liberty ships to have transported it overseas—the 540,000 miles.

if transported overseas, a year's supply for Korea. It would have taken two Liberty ships for that old wire and 7,000 commercial passenger-car automobiles could have been manufactured with the steel that is saved in the new wire, the 540,000 miles of new wire.

These are some of what we are getting with our research and development money. We have a sample of the old wire here, if you wish to see it.

Mr. RILEY. Do you have any of the old stock on hand?

General O'CONNELL. We are completely out of the old stock. We have been supplying only the new stock since May.

Mr. SCRIVNER. Your unit cost on that is what—$87?

General O'CONNELL. $87 per mile.

Mr. SCRIVNER. How does that compare with the other? The unit that you are asking for is also figured in miles, is it not?

General O'CONNELL. Yes, sir. The other cable is in quarter-mile lengths.

Mr. RILEY. How does this new field wire compare in cost with the old?

General O'CONNELL. Based on present prices, we calculate that the old wire would cost $140 per mile compared to $87 for this. We also make a saving in this wire by not having to use so many reels, because it is possible to put it up in dispenser form which goes on the soldier's back and pays out like a ball of twine that you would get in the drugstore.

Mr. SCRIVNER. I thought that we were told that you could lay this wire by plane?

General O'CONNELL. We can. We are putting these dispensers together, coupling them up and paying out miles of this wire from an airplane at that rate of speed.

Mr. RILEY. Do the lasting qualities of this compare favorably with the old?

General O'CONNELL. They do. It does not have quite the tensile strength of the old, but it stands up comparably well; it has stood up very well in Korea.

Mr. RILEY. How is it affected by atmospheric conditions?

General O'CONNELL. It does much better under atmospheric conditions than the old wire. This wire will talk dependably whether the weather is wet or dry. The old wire lost talking range when it was wet due to the increased capacity between the wires.

Mr. RILEY. Are there any further questions on this?

Mr. SCRIVNER. The only question that I have, Mr. Chairman, how the requirement is computed. But after the inquiry that I made this morning about their having enough barbed wire in Korea to go around the world twice, I am wondering what someone will say if he reads these figures and makes a hasty computation and finds that this is enough wire to go around the world something around 20 times. You had better give us some rather tight well-pointed computations on this.

Mr. RILEY. What is your lead time on this?

General O'CONNELL. Our lead time on this is 9 months. I can give you an over-all story of the field wire in general.

Mr. RILEY. With minimum production capacity, what percentage would go into the reserve?

General O'CONNELL. I will go back into a little bit of history in World War II. Field wire in all categories was in short supply more or less continuously throughout World War II, and this despite a very great reduction and an effort made to expand production and get new facilities. We had 24 plants producing field wire in World War II and it attained a maximum peak production rate of 275,000 miles per month. This was still short of theater requirements.

This wire is the Signal Corps equivalent of ammunition for artillery. It is a noncommercial item. It is needed only in combat, except for smaller quantities for training, but the consumption in combat is very large.

Mr. SCRIVNER. General, in view of your last statement about the high combat use, I wish you would explain to the committee in more detail how wire which is normally strung the way this is can have such a high combat use.

General O'CONNELL. Based again on World War II experience, which is confirmed by our experience in Korea, a division in combat utilizes an average of about 3,000 miles per month of field wire. This is due to the fact that the initial installation, which they can put in in about 2 days, takes about 700 miles of wire to wire them in. The extension of this in moves forward or in retrogressive movements to the rear can run into 2,000 miles for a division system within a week or 2 days, in the extension of outpost lines, and so forth. And if there is a movement forward or to the rear—if the movement is to the rear in retreats, you lose the wire you leave behind you, necessarily, because you do not have an opportunity to pick that up. Also, in readjusting the front in an attack and the front of one of the units becomes narrow and that unit is pulled out of line and shifted to another point, when it is pulled out it does not have time to pick the wire up. So the more flexibility and the more maneuverability employed in combat operations, the higher the consumption of wire.

If those units were pulled out of line and put into reserve or rest areas and had a few days to pick up the wire, we would save a lot of wire; but the present concept of soldiering is that a unit is fighting virtually all the time and when it is pulled out of one position and sent to another it puts in a new wire system there and has to leave the old wire in the old location. It is also difficult for another unit to come in, unless the set-up is exactly the same, and utilize the wire system left by the preceding unit. It can sometimes be done. But on the beaches of Normandy, for example, when units were moving through rapidly, their only solution was to lay a new wire system, and one division after another laid on top of the preceding wire system a completely new set-up of field wire.

Mr. RILEY. Would this new type of wire be more recoverable than the one used in World War II?

General O'CONNELL. It is, because it is lighter and easier to pick up.

Mr. RILEY. Have you had any experience to show your recovery?

General REEDER. Before you leave that, if I might add, you [General O'Connell] left out a thing which makes very great usage of wire. In talking of it General O'Connell spoke of it as though once in it stayed in in good shape. That is not generally true. When a tank outfit has crossed your sector, you can start in and lay all your lines over again. Almost invariably they go over them and cut them to bits.

Mr. SCRIVNER. And it is easier, quicker, and cheaper to lay new wire than to try to find the weak spots and patch them up and then find that probably you missed one or two; so that you get your communications back into service much more quickly by laying new wire, with more reliability?

General O'CONNELL. That is right.

Mr. SCRIVNER. And while it might be a cost of money, it is an economy in time?

General O'CONNELL. That is right.

Mr. SCRIVNER. And it assures satisfactory communication.

General REEDER. It saves lives, too. You receive damage from both enemy and friend in the wire system. I have even seen jackasses going down for water walk right down on the wire; they are sharp-shod, and we lost the circuit just while they were going down to the stream to be watered.

General O'CONNELL. And a large field tank operation through the area will take out the wire.

Mr. SCRIVNER. And in action, when they are on the move, they are not concerned about looking for wire or anything else; they just start going through; they step over it and they are not concerned about who is on the other end, but they go right through and, if they snap it, they snap it.

General REEDER. In the desert landmarks were few and a tank or any vehicle trying to find its way would follow the wire; half the time they would straddle it and sometimes they would pick it up, because they knew the wire led to somewhere where someone could tell them where they were.

Mr. SCRIVNER. I think with these comments it gives a better picture to the average person of some of the difficulties we have and why there is this high combat usage.

General O'CONNELL. Perhaps I should add that a recovery and a rehabilitation program is being conducted in Korea and Japan.

Mr. SCRIVNER. For saving as much as you can?

General O'CONNELL. For saving as much as we can; but it still has not substantially reduced the consumption.

Mr. RILEY. Is your production capacity of this new wire more than of the old type?

General O'CONNELL. No. It has not been built up to where it is more than the old type, as yet. We have a production capacity which had to be rapidly increased and we had to go on a two- and three-shift basis with the capacity we had; because we ran completely out of old field wire along about last April or May, when the new wire was not into full production and, in order to keep Korea going, we had to go on a two- and three-shift basis.

(Discussion off the record.)

Mr. RILEY. This request for an appropriation is based on the production run you mentioned in the off-the-record statement?

General O'CONNELL. It would be based on keeping 15 of our present 21 plants going at the minimum possible rate so as to maintain in being a mobilization reserve of production.

Mr. RILEY. Will those others be maintained on a stand-by basis, not in operation?

General O'CONNELL. That is right, sir.

Mr. RILEY. Do you have any stock on hand now, in reserve?

General O'CONNELL. Of the new wire?

Mr. RILEY. Yes.

General O'CONNELL. We have 240,000 miles on hand as of the 1st of February. Our estimated requirements for the first half of this fiscal year for Korea were 279,000. We saved a little bit on that, due to the reduced activity. Actual shipments during the first 6 months were 253,000. Requisitions recently, however, have been picking up and are now running at a rate of 46,600 miles a month, so that throughout the year we will fall perhaps 10 percent short of our estimate; but it will be close.

(Off the record.)

THURSDAY, MARCH 13, 1952.

ARMY-NAVY NOMENCLATURE FOR ELECTRONICS AND COMMUNICATIONS EQUIPMENT

Mr. RILEY. General O'Connell, you were discussing the requests of the Signal Corps. You may proceed.

General O'CONNELL. Yes, sir, Mr. Chairman. A request was made by the committee for an interpretation of the Army-Navy nomenclature and I have some charts here which I think will explain that.

(Off the record.)

Mr. RILEY. We appreciate your furnishing us with this information.

Mr. SCRIVNER. Let us take one of these items and see if we can interpret it correctly. For instance, there is this radio set. The letter A indicates Army, is that right?

General O'CONNELL. Yes, sir.

Mr. SCRIVNER. And the N, indicates what?

General O'CONNELL. N is Navy. The first two letters there indicate that it is a joint type, a standard military type. It would not have the AN nomenclature if it were a commercial type. That has to be a military set.

Mr. SCRIVNER. Referring to your field wire, you have the designation WD. That does not come under this?

General O'CONNELL. No, sir. That is not considered in the item of equipment. To get that you need this sheet here for a further extension of the nomenclature system.

This represents a major effort which was made in 1942 and 1943 on the part of the Army and the Navy to coordinate these nomenclature. To answer specifically your question, WD, which is shown about five lines from the bottom in the left-hand column refers to cables, two conductor. W is for wire.

General REEDER. Wire dual.

General O'CONNELL. For instance, WF is W for cable and F for four; WM is cables, multiple conductor; WS is cables, single conductor; and WT is cables, three conductor.

Mr. SCRIVNER. How does ZM work?

General O'CONNELL. Z is the electrical symbol for impedance. We use the standard symbols of the Institute of Radio Engineers.

Mr. SCRIVNER. I think that is enough for now; that explains it well and if we get stymied with these, we shall call on you again.

General O'CONNELL. In the future we shall try to include a clearer description of each of these items.

AN/GRC–8 RADIO SETS

Mr. RILEY. The next largest item we have is for the AN/GRC–8 radio sets, 5,218 of them, costing $14,960,006. Is that a complete set?

General O'CONNELL. That is a complete set. I have a photograph to show you what that set looks like, if you would like to see it.

It is a vehicular-mounted set. It can be taken out of the vehicle and operated outside of the vehicle, on the ground. It is a frequency-modulated set for the Infantry.

Mr. RILEY. How heavy is it?

General O'CONNELL. It is very heavy; I would say it weighs about 400 pounds. Is that about right, Mr. Montgomery?

Mr. MONTGOMERY. It weighs approximately 400 pounds.

Mr. SCRIVNER. It is both sending and receiving?

General O'CONNELL. Yes, sir.

COMPUTATION OF REQUIREMENTS FOR AN/GRC–8 SET

Mr. SCRIVNER. While we are on that subject, let us have a little more information as to how you computed your requirements.

(Off the record.)

Mr. SCRIVNER. Are you contemplating any particular improvements in this type of set, either to make it lighter, more compact, or more impervious to many of the troubles that you have run into, or are you trying to get a lower price, or are you figuring on ever getting to the point where you would be using transitors, and so forth?

General O'CONNELL. There are development programs going into those fields; but they are long-range programs.

Mr. SCRIVNER. We understand that, but we are continuousuly spending money for research and development. Research and development comes in with pretty much a routine story of how they are advancing, how they are bringing out new products, how they are simplifying, how they are miniaturizing, how they are getting the items better and cheaper and more effective, and so on. While I have no objection to making funds available for items like this, for your immediate need, it seems a little out of line to be piling up a backlog of equipment of this kind, which is a type that becomes outmoded pretty quickly. If there are going to be developments that will give you a better, a lighter, a cheaper, a more economical unit, why stockpile these items?

General O'CONNELL. That is a very good point, sir.

Mr. SCRIVNER. There should be a happy medium that we can strike.

General O'CONNELL. We try to continue to make progress in the field of communication and electronics to keep up with the advance in the art. The transistor opens up a new field which we are exploring. However, it will take years to explore that field and to get the transistor developed to the point where it will have wide usage.

For example, the frequency limitations of the transistor at the present time are about 10 megacycles. This set operates 38 to 54 megacycles. So it is well beyond the range of the transistor. Some of

them could be used at various places in the set; but I would say it would be 5 years before we have the transistor to the point where any major set will be replaceable.

Mr. SCRIVNER. Let us assume that it will be 5 years. Do you have more than one plant making this radio set now?

General O'CONNELL. We do.

Mr. SCRIVNER. Are they working one shift or more than one shift?

General O'CONNELL. They are working one shift.

Mr. SCRIVNER. So that the present situation is that as far as the production line is concerned, it is going so that we could get increased production with a fair degree of speed should the necessity arise?

General O'CONNELL. Yes, sir. This set has a 12-months lead time.

Mr. SCRIVNER. That is not as great a lead time as some of the other items have. It is about the same lead time as that for your vehicles so that you would probably have them all coming off together.

My Scotch instinct rebels against getting so many of these items, which are of a type that get old much faster than other items, to put into war reserve. As to some other items, it would not make very much difference outside of the inconvenience of having to store and keep them, whether the war came 3 years from now or 5 years from now or 10 years from now; but that is not true of an item like this radio.

General REEDER. I would like to supply the answer to that, if I may. The provision of equipment only for the active forces will not work in the situation in which we find ourselves now where we no longer are protected by allies or friends who will take the first shock. If we had not had as a legacy from the Second World War a pretty good supply of radio sets in storage, even thought they were being rendered obsolete by this set coming along, we would not have been able to handle Korea. There must be a reserve upon which to operate until the production line can come up, and this one will take about a year.

May I go off the record for a moment now?

(Off the record.)

General REEDER. There is another factor entering into this matter of change in communication equipment. It is not possible readily to change one radio set without changing the whole system, because of the frequency problem. The radio system to which you change must utilize the whole radio spectrum and must also provide the necessary intercommunication. So that to change one without considering a change of all the others is wrong and when if we do propose a change there will have to be a gradual introduction. As an example, we cannot issue some of these sets to a division and some of the sets which it replaces, because they will not intercommunicate.

REASONS FOR HAVING SEVERAL DIFFERENT RADIO SETS

Mr. RILEY. Mr. Scrivner, if you would yield to me for a moment, I would like to ask a question. I notice, General, you have something like 17 different radio sets listed here. That seems an enormous number of different radio sets. What is the explanation of that?

General O'CONNELL. There are six of these types that differ only in frequency and the assembly of components that go to make up the set. There are ten major components—that is, groups of transmitters, receivers, power units. They form a family of sets. You take one

transmitter and one receiver and make up a set for the infantry. For another set, you take one transmitter and one receiver and a power unit—the same power unit—and you make up a set for the artillery. Likewise for the armored division. We have all that on a chart here if you would like to see it; in other words, the nomenclature does not indicate necessarily that it is a completely different set.

Mr. RILEY. Some parts are different?

General O'CONNELL. Some parts are different because they have to operate in different frequency bands for the different branches of the service. Otherwise there would not be enough frequencies to go around.

The armor has to use a band of frequencies and there is an overlap with the artillery. The artillery has a band of frequencies which does not interfere with the infantry and also there is an overlap on that with intercommunication between the two systems.

Mr. RILEY. In other words, there are not as many different models as would seem to be indicated by the list of requirements submitted here?

General O'CONNELL. That is right. Take the walkie-talkie. We have three of these sets, the AN/PRC–8, 9, and 10. They are exactly the same type and look the same, have the same controls and a man who can operate one can operate the other.

The 8 is for the armor and is in the armor frequency band. The 9 is for the artillery and is in the artillery frequency band and the 10 is for the infantry and is in the infantry frequency band. But they can intercommunicate in the overlapping bands of the sets; but they do need to have separate sets.

Of course, it would be advantageous if we could make one set that would cover the entire frequency band and eliminate these three types, but the art does not know how to do that yet in the size and weight that are required for forward-area use.

We have made some substantial accomplishments in reducing the number of types of sets, because we have at the present time this situation. We had the SCR–194; the SCR–195; the SCR–511; the SCR–509; the SCR–510; the SCR–609; the SCR–610; the SCR 619; and the SCR–300. All these sets that I have enumerated with SCR symbols will be replaced by three sets.

Mr. SCRIVNER. What is the explanation of the symbol SCR?

General O'CONNELL. That is the old nomenclature.

Mr. SCRIVNER. That has been abandoned?

General O'CONNELL. Yes; that is obsolete.

General REEDER. That is from World War I.

General O'CONNELL. The same is true in the vehicular field. That is, these standards components go to make up 21 different types of sets—10 standard components put together in different combinations go to make up 21 different sets by nomenclature for the vehicular and ground series that is the GRC–3 to 8 series.

Mr. SCRIVNER. While we are on this subject and for the information of the committee—it is not necessary to put this in the record—will you please go through these items and furnish a table to show us just what you are going to do with each?

(Off the record.)

General O'CONNELL. Yes, sir.

Mr. SCRIVNER. Will you do that for these items and furnish that information for the committee?

Geenral O'CONNELL. We should be glad to do that.

(The information requested was furnished for the committee files.)

(Discussion off the record.)

GRC–3 AND 4 RADIO SETS

Mr. SCRIVNER. General, we have been talking about the GRC–8 radio set, which is to be used by the infantry and airborne divisions. Will you give us an explanation of your request of the 3 and the 4, which are similar radio sets?

General O'CONNELL. The 3 and the 4 are used by armor.

Mr. SCRIVNER. 3 or 4 or 3 and 4?

General O'CONNELL. 3 and 4 are used by armor. They have a different arrangement of components: 1, for example, has an extra receiver; 5 and 6 are used by the artillery.

Mr. SCRIVNER. Wait a moment. That is not what your table here shows: 3 is indicated for armor and 4 for artillery.

General O'CONNELL. That is incorrect, sir; that is a typographical error, that is a mistake.

Mr. SCRIVNER. Well, I did not get these up.

General O'CONNELL. That should show armor.

Mr. SCRIVNER. Which?

General O'CONNELL. Both 3 and 4 should show armor.

(Discussion off the record.)

Mr. SCRIVNER. The GRC–3, then, is for the armored division?

General O'CONNELL. Yes, sir.

Mr. SCRIVNER. And the GRC–4 is for the armored division. As you set it out in your statement, the GRC–3 radio set is a compact, medium-range, ground or vehicular radio set; used by armored divisions.

Just below that you have another set which has the same description. What are you going to do with that?

Mr. RILEY. And there is a difference in cost of some $480.

General O'CONNELL. I would like to ask Mr. Montgomery to answer that question.

Mr. MONTGOMERY. Gentlemen, the reason for the variety of sets is to effect economy in operation. Taking the ANGRC–3 and 4 as examples, the 3 represents the command set. For example, the company commander requires a piece of equipment that will talk to his other tanks and fill pass the commands to the tanks, the tank formation. On top of that he must also work in a net with other tank groups or other companies.

Mr. SCRIVNER. He has to work up and down?

Mr. MONTGOMERY. That is right. So, he carries an extra receiver so that he can monitor the channel on which they communicate between units. Then, if he is called for any reason, he can then break in and communicate with other units. On top of that he also must have communication with his supporting foot troops, so the AN/GRC–3 for the armored and the AN/GRC–7 for the Infantry perform exactly the same job and represent the most complicated arrangement.

Mr. SCRIVNER. Let us pause at that point. We were talking of the GRC–3.

Mr. MONTGOMERY. Yes, sir.

Mr. SCRIVNER. We were told that was for an armored division. Now, below that, you have a GRC–4 also for an armored division. What is the GRC–4?

Mr. MONTGOMERY. The GRC–4 provides communication between the tanks comprising, say, a tank company, without the extra receiver, since they work within themselves and the commander is responsible for monitoring the other net, so that they can instantly communicate.

Mr. SCRIVNER. Let us hold it right there. The GRC–4 is in the tank itself, within the tank company, so that they can talk back and forth among themselves and with their company commander. Now, when you go back up the line, I see that your demand for tank sets is less than 2,000 more than your net requirement for these company commander radios. Surely you are not going to have 2,000 more company commanders than tanks.

Mr. MONTGOMERY. No, sir. In addition to the tanks, there are many installations where again you must monitor more than one unit, and where you have that is where you use the GRC–3, for monitoring more than one net continually.

Mr. SCRIVNER. I think that you gentlemen do not realize the position you are in. You are in much the same position of a plaintiff in a lawsuit. It is up to you to prove your case. It is not our job to try to dig out this information. I was merely taking your statement; and I assumed, when you got through telling me about the GRC–3, that you would have given me the whole picture. But the picture you gave me does not stand up. I know very well—as little as I know about tank engagements—that you are not going to have 2,000 fewer company commanders than the number of tanks with these sets in them.

You are going to have to sit down and draw a pretty good picture of your need for these, as far as I am concerned. After all, they cost $3,400 apiece.

General O'CONNELL. We have the picture here of the build-up showing how these requirements are computed for the various elements of the Infantry division, the airborne division. But we do not have a complete picture showing you the build-up of requirements; that is our Table of Organization and Equipment.

Mr. SCRIVNER. We are not talking about airborne now. We are talking about armored.

General O'CONNELL. Yes, sir. We have a series of charts here, if you would like to see them.

General REEDER. In the first place, that set is used by the platoon commander as well; is that right?

Mr. MONTGOMERY. That is right.

Mr. SCRIVNER. Perhaps it is. That is my point. I cannot do anything except accept the statement given to me.

General REEDER. I think you will have to get the requirements showing the different types of people to whom this set is issued.

Mr. SCRIVNER. Is this item of 20,800 radio sets for tanks?

General REEDER. I believe you will find that they are used in other places besides tanks.

Mr. SCRIVNER. All I can do is to go by what I have been told up to this point. If they are going to be used somewhere else, we should be told that before we get to this point in the presentation. I am merely going by the statement that was made to me that certain of them were

going to be used in company-commander tanks and the rest of them were going to be used in the tanks in the companies.

My recollection of the request for funds for tanks is that it does not go up to anything like these figures.

Mr. MONTGOMERY. Sir, I had not finished my explanation. I was giving you an explanation of the tanks. This also goes in other combat vehicles; your gun carriages, your armored vehicles; and there is a major allowance for noncombat vehicles for the various echelons.

Mr. SCRIVNER. Nobody prevented you from telling me that when I asked for the information.

Mr. MONTGOMERY. I had not gotten that far, sir; I am sorry.

Mr. SCRIVNER. But you had stopped talking about the GRC–3?

Mr. MONTGOMERY. I was trying to relate the use of the GRC–3 and the 4; the VRC–8; the VRC–12, and one other set, that ties in, to effect an economy in operation by reducing the number of components, by using common components, and thereby reducing the cost of the total installation.

On the GRC–3, which is the most complex of the installations, we have the separate receiver, the main receiver transmitter, the auxiliary receiver transmitter, and interphone equipment.

Mr. SCRIVNER. You mentioned two others—the VRC–8 and which other?

Mr. MONTGOMERY. There is the VRC–13, too.

Mr. SCRIVNER. Where do I find the VRC–12 and 8 in here?

Mr. MONTGOMERY. They are not items appearing in the budget, sir.

Mr. SCRIVNER. Oh, you have plenty of those?

Mr. MONTGOMERY. Yes, sir.

General REEDER. The funds provided were sufficient to carry the line.

Mr. SCRIVNER. I see the VRC–13. That is a vehicular short-range set installed in open combat vehicles used by armored divisions?

Mr. MONTGOMERY. That is right. Then you have to have the comparable set-up for the infantry, using the AN/GRC–7 and 8; the VRC–10, the AN/VRC–15; and by using the lesser number of components on each set we try to save in materials and in expenditure.

General REEDER. I believe you could illustrate to the committee very well by sending up tomorrow a tabulation showing so many units which get so many of these sets.

Mr. SCRIVNER. I think that should be done. And, if you are going to do that, put in a figure that is readily understandable. We are primarily concerned with what we have before us in requests for funds. I do not care how you start it out, whichever is the most logical way. If you want to start at the top with the GRC and show where they are used and then come on to the others below, to the tanks themselves, as well as the VRC's—by the way, what is VRC?

General O'CONNELL. Vehicular radio communication.

Mr. SCRIVNER. That will take you at least through 13. I do not know how many others there are in here. You have a VRC–16.

General O'CONNELL. That is not a part of the series. That is a different set.

General REEDER. The full explanation of this on one set is going to be quite a voluminous document.

Mr. SCRIVNER. Let us go off the record for a moment.

(Discussion off the record.)

Mr. RILEY. In regard to the prepared statement which was asked for by Mr. Scrivner, I would be glad, General, if you would include the items actually delivered up to December 31, 1951, how many are to be ordered between now and June 30, and how many you have under firm contract. That will give us the picture as of the end of this fiscal year.

General O'CONNELL. You want a complete development of the procurement plan for placing orders, and the number delivered?

Mr. RILEY. Give us an analysis of the situation for committee use only.

General O'CONNELL. That we will do.

(The information requested was furnished for the committee files.)

ARC–22 RADIO SET

Mr. SCRIVNER. Now, let us go to one more. Tell us about this ARC–22. That means it is airborne-radio communication?

General O'CONNELL. That is right. That is the set that goes in the Army airplane or helicopter.

Mr. SCRIVNER. You are talking about Army airplane as distinguished from an Air Force airplane?

General O'CONNELL. That is right. These are airplanes that are used by the Artillery for spotting artillery fire and for other purposes for the Army, and this quantity is phased on the number of airplanes that will be produced. The set is purchased by the Air Force. They have developed the set for the Army.

Mr. SCRIVNER. So that the plane comes to you with the set on, or do you put it in after you procure the plane?

General O'CONNELL. It will be put in either way; either at the factory, if the sets can meet the plane at the factory, or it will be put in separately.

(Discussion off the record.)

Mr. SCRIVNER. This is a new item?

General O'CONNELL. A newly developed item. It will have to go into airplanes which are already in service, as well as airplanes which are to be delivered; that is, it is a replacement item for the older set.

General REEDER. That is part of the Air Force change of the whole frequency pattern.

Mr. SCRIVNER. If I recall the information yesterday, your older sets are being pretty well worn out both here and in Korea; so, I am curious now as to how many of these are replacements for older aircraft and how many for new aircraft.

General O'CONNELL. We can furnish that and will be glad to do so for the committee.

(The information requested was furnished for the committee files.)

Mr. SCRIVNER. Yesterday I asked for an inventory of aircraft, and we were given it as of January 1, 1952. I do not know whether it went in the record or not, but I want this for the committee at least.

(Off the record.)

So that on this item, Mr. Chairman, I would request it be tied in with specific information relative to Army Air.

General REEDER. I think we can do that.

Mr. SCRIVNER. Let us do it all at once.

General O'CONNELL. We will furnish that. We are going to furnish a recapitulation of the requirements versus the actual on-hand, on-procurement, and to-be-bought aircraft.

(The information requested was furnished for the committee files.)

MPQ–10 MORTAR LOCATER

Mr. SCRIVNER. Now, let us go back to the MPQ–10—mortar locater.

General O'CONNELL. This is a mortar locater which has been in development for quite a long time. The assets of the old item which was used for this purpose prior to Korea have been consumed. It is necessary in order to keep this production line going to reorder in July of 1953. This procurement quantity is to apply entirely against the reserve.

Mr. RILEY. You have none in reserve now?

General O'CONNELL. We have none in reserve now. Delivery will start in April of this year.

Mr. SCRIVNER. That is, delivery of those ordered with previous year's funds?

General O'CONNELL. That is correct.

(Discussion off the record.)

Mr. SCRIVNER. Is this in its final form, or is this just about ready to go into some changes?

General O'CONNELL. No; this is in its final form.

(Discussion off the record.)

Mr. SCRIVNER. In words of the layman, you might say this is an instrument that will back-track a mortar and you can get the location of the mortar which is firing the shell?

General O'CONNELL. It will pick up the mortar shell in flight in its trajectory and transmit that data to the plotting board, which will enable the computers to spot the location of the mortar that was firing the shell.

Mr. SCRIVNER. Is the cost figure shown here a pretty firm figure?

General O'CONNELL. That is based on the cost of current production.

Mr. RILEY. Is there any likelihod of getting a better price as production increases?

General O'CONNELL. Well, it is difficult to say. None of those contracts have been through redetermination as yet.

PRC–6 RADIO SET

Mr. RILEY. What about the next item, PRC–6, "Portable radio communications"?

(Discussion off the record.)

AVAILABILITY OF SIGNAL CORPS COMBAT CONSUMPTION DATA

Mr. SCRIVNER. Do you have any figures showing the actual combat consumption up to a certain date?

Mr. MONTGOMERY. No, sir.

Mr. SCRIVNER. If you can get actual figures on consumption of ammunition, I do not see why you cannot get actual figures on consumption of Signal Corps equipment.

(Discussion off the record.)

Mr. SCRIVNER. Up to what date do you have fixed, firm figures based on reports of your combat consumption?

Mr. MONTGOMERY. We have that through the fiscal year 1951; that is, to June 30.

Mr. SCRIVNER. That would be to June 30, 1951?

Mr. MONTGOMERY. That is right.

Mr. SCRIVNER. And that was how many?

(Discussion off the record.)

Mr. SCRIVNER. That is a firm, fixed figure; but from the 30th of June 1951, up to the present time, you do not have any fixed figure of combat consumption?

Mr. MONTGOMERY. No, sir.

Mr. SCRIVNER. How did you calculate that you would have in 1952 combat consumption of this number?

Mr. MONTGOMERY. The computation was made by multiplying the allowances of the theater by their monthly consumption factor or replacement factor for the set, and multiplying that by 12 for the yearly figure.

Mr. SCRIVNER. Based upon what monthly consumption rate—as shown by your actual experience in previous years?

Mr. MONTGOMERY. The factor we have used for this computation was the World War II replacement factor for Europe.

Mr. SCRIVNER. But you were not having near the experience in this that you were in the last year of World War II. That was a pretty terrific combat.

General O'CONNELL. The losses here have been even worse; the losses of equipment have been even greater in Korea than they were in Europe.

Mr. SCRIVNER. Let us take the Korea figures. They showed for fiscal year 1951, which took in the first year of the war, this number?

General O'CONNELL. We only had one division over there for about 6 weeks, or an average of one division. The Twenty-fourth Division was equipped almost entirely three times, due to losses.

Mr. SCRIVNER. During that 1 year?

General O'CONNELL. During that 1 year.

Mr. SCRIVNER. Is not that included in this number?

General O'CONNELL. That is right. But our troop strength was low during the early days.

Mr. SCRIVNER. Can you tell me how many you lost in the month of December 1950?

Mr. MONTGOMERY. We do not get the monthly figure.

Mr. SCRIVNER. Can you give me what you had in the month of June 1951, which would be your last month?

Mr. MONTGOMERY. We get a figure by 6-month periods; we do not get a report of monthly consumption.

Mr. SCRIVNER. What was the report on your 6 months from January 1 to June 30, 1951?

Mr. MONTGOMERY. I can get that; I do not have the figures with me.

(The information requested is as follows:)

Combat consumption for this item was 7,880 between January 1, 1951 and June 30, 1951.

Mr. SCRIVNER. Mr. Chairman, I am about ready to give up. I do not see why this presentation cannot be made without going through all of the difficulty of trying to get the information item by item, line by line, and then be met by the statement they do not have the information here.

General O'CONNELL. If we had a picture of the type of information the gentlemen wanted, we would have had it for you. We are anxious to get you all the information you want.

(Discussion off the record.)

REPERFORATOR TELETYPEWRITER

Mr. RILEY. What is this reperforator teletypewriter? Is that a new item?

General O'CONNELL. That is a new set.

Mr. RILEY. This unit cost, then, is an estimated cost at the present time?

General O'CONNELL. No, sir; the price is based on the current contract cost. This is a new highspeed item.

Mr. RILEY. There is a possibility that this unit price will be reduced after you get into production?

General O'CONNELL. We have these on order now. This will not be the first production; that is, the quantity requested in this budget will not be the first production of the item. The item is in production now. We have two lines on it.

Mr. RILEY. When did that go into production?

General O'CONNELL. We will get our first production next October on those two lines.

Mr. RILEY. October of this year?

General O'CONNELL. October of this year. In September of 1953 that line will end and in order to continue the line it will be necessary to place a new contract in July of 1952.

Mr. RILEY. Is this article subject to price redetermination?

General O'CONNELL. This will be subject to redetermination, but there has been no redetermination, of course, at the present time. The prices are based on the current contract.

(Discussion off the record.)

Mr. RILEY. How much competition is there between the manufacturers of an item of this character?

General O'CONNELL. There is competition between the number of manufacturers who are producing it in two ways: first, an effort on our part to keep their price down and get it down to the lowest possible figure by comparison against the other line; secondly, they realize that when there is a cut-back in production we will continue the line of the most economical producer, which does have a definite competitive effect.

Mr. SCRIVNER. This is a new development. It is a lighter and more compact machine?

General O'CONNELL. It is a radically new and different teletypewriter machine.

Mr. SCRIVNER. The weight is considerably less than the TC–16?

General O'CONNELL. That is right.

Mr. SCRIVNER. What kind of inventory do you have of the TC–16?

(Discussion off the record.)

Mr. SCRIVNER. Where are these sets going to be used; how are they going to be designed?

General O'CONNELL. They will be used in vehicular radio equipment; they will be used in communication centers, Army, corps and division, and at higher headquarters.

Mr. SCRIVNER. But it won't come down below divisions?

General O'CONNELL. No, sir; it will not come down below divisions.

Mr. MONTGOMERY. With one exception. These are used at intelligence points where monitor stations are picking up transmitters.

Mr. SCRIVNER. In other words, this all operates by wire?

General O'CONNELL. That is right, but it can operate over a radio circuit.

General REEDER. It will operate anywhere that tape transmission is used.

General O'CONNELL. In radio, also.

Mr. SCRIVNER. But normally by wire?

General REEDER. Any place where you have stuff coming in and want to retransmit it without having the operator sit down and punch it out.

Mr. SCRIVNER. In other words, this is the machine into which your teletype tapes are fed and retransmitted?

General O'CONNELL. Yes, sir; and it makes another tape from the incoming signal which can then be retransmitted.

General REEDER. It makes a tape for transmission and makes a copy and you hook the tape onto the circuit that is working relay.

General O'CONNELL. It is used both on radio and wire circuits, but the majority of it is on wire circuits.

Mr. SCRIVNER. How difficult are these to maintain?

General O'CONNELL. A teletypewriter repair man is required who is trained for approximately 8 months. It is a specialist job. We expect the maintenance of this set will be simpler, since it has fewer moving parts than the older conventional type of teletypewriter machine. But the proof of the pudding will be in the eating and we do not have that yet on a large scale.

Mr. SCRIVNER. Is this in civilian use?

General O'CONNELL. No, sir; it is not; it is purely a military item at the present time.

Mr. SCRIVNER. But it does have civilian possibilities?

General O'CONNELL. That is right, and Western Union has evinced interest in it, although no commercial manufacturers have undertaken to manufacture it for commercial purposes as yet.

Mr. RILEY. Thank you very much, General.

Mr. MAHON. Mr. Sikes cannot be here this afternoon and I left the Air Force hearings to come over here and be with you gentlemen.

Mr. Scrivner, you are in close touch with the developments and I hope you will take the liberty of just proceeding with the line of questions which you were pursuing.

Mr. SCRIVNER. When we closed the session yesterday, there had been a request made by the committee for a different type of presentation of some of the Signal Corps equipment for which funds are being asked in the 1953 appropriations, and I understand they are now ready to present that.

TC–10 TELEPHONE

We had not during the previous hearings discussed the TC–10 which is the telephone, central, manual, had we?

General O'CONNELL. That is right.

Mr. SCRIVNER. Since that is the first one, let us proceed on that one and get it out of the way. Is there a brief statement you can give us on this item?

General O'CONNELL. Here is a photograph of the item and a description of it [submitting].

(Discussion off the record.)

Mr. SCRIVNER. What is the item; what duty does it perform?

General O'CONNELL. It is a field switchboard. It has no commercial counterpart. It is for military use at corps, army, and supply installation headquarters.

Mr. SCRIVNER. In other words, this is what we would normally refer to as a pretty large central station for a telephone?

General O'CONNELL. Yes, sir. It can be rapidly put together and provides a three-position board, and facilities for toll as well as local service.

Mr. SCRIVNER. How many lines will it carry?

General O'CONNELL. Two hundred and seventy lines, 90 of which are magneto and 180 common battery.

Mr. SCRIVNER. Is the price of $29,919 a fairly firm price?

General O'CONNELL. That is based on the average of what we are paying on current contracts.

Mr. SCRIVNER. Will the acquisition of this small amount of reserve serve in any way to keep your assembly line going?

General O'CONNELL. It will keep it going long enough so that with 1954 money we would be able to prevent it from going down.

RL–109 REEL UNIT

Mr. SCRIVNER. Next is your RL–109. Give us a brief description of that.

General O'CONNELL. This is a gasoline-driven reel unit for laying and recovering telephone field wire and cable. It replaces the unit known as the RL–26. It is set up to be put in the back of a 2½-ton truck and, with its gasoline-engine-driven reel, as the truck moves along the road, the wire is retracted as they take it up off of the ground onto reels of 1 mile each.

Mr. SCRIVNER. Why is this reel necessary? In my younger days, at one time I worked on the maintenance of long-distance telephone

lines, and I had the task many times of stripping old line, recovering the wire which, of course, is a much heavier type of wire than what you have, and we succeeded pretty well in handling it with a hand reel.

General O'CONNELL. It is a matter of getting up more wire with the same amount of manpower, and getting it up in less time.

Mr. SCRIVNER. Yes; but you have a much lighter wire to bring in now, that is going to be easier to handle.

General O'CONNELL. That is true. We still get a gain, however, in the speed in which we take it up, the number of miles which can be covered in a given length of time; and the difference is of the order of about 5 to 1. If it has to be manually wound up by a man on the back end of the truck, he cannot wind very fast and it is not possible under those circumstances to proceed along continuously at, say 3 to 4 miles an hour. You have to stop about every couple hundred yards and let the man on the truck reel it up.

Mr. SCRIVNER. What is the matter with the RL–26?

General REEDER. We are out of them.

General O'CONNELL. We are out of the RL–26.

(Off the record.)

General REEDER. It is your intention to wear out the RL–26 before this is used?

Mr. MONTGOMERY. It is our intention to use up the 26 as we go.

General O'CONNELL. This is an improved unit of greater reliability—a better unit than we had in the RL–26.

Mr. SCRIVNER. Looking back at the figures given us yesterday on the consumption, even though this reel works more smoothly, is motor-driven, and so forth, apparently you are not doing a good job on the recovery of wire; are you?

General O'CONNELL. We might as well face it, that we are not recovering a high percentage of our field wire. They have a program on in Korea for the recovery of wire. I had the figures the other day of the amount of wire that has been picked up; but, since we had finished the discussion of the field wire quantity, I did not bring them over with me today. It amounts to a relatively small percentage, however, of our consumption rate and, as I recall, for the last half of fiscal 1951 it ran about 3 percent of the total quantity which was being picked up and rehabilitated.

ADVISABILITY OF RECOVERING FIELD WIRE

Mr. SCRIVNER. If you are picking up only 3 percent, as I make a pretty rapid calculation, are you picking up enough to repay the cost of these units?

General O'CONNELL. We are picking it up in the United States as well, of course, as we are in Korea, and we pick it up for training use. The wire is completely recovered and the unit is left on the scene until it has recovered its wire.

Mr. SCRIVNER. I am trying to reconcile in my own mind the advisability and wisdom of this operation.

General O'CONNELL. I might say the amount of field wire recovered depends on the rapidity of the action.

Mr. SCRIVNER. I understand that; we have gone through that and I have reeled in wire myself. I know how difficult it is to pick this stuff up when you are moving forward, and it is impossible in what

we politely refer to as a retrograde movement because we do not like the word "retreat." And if these figures stand up, 3 percent would not even repay the cost of your pick-up units, as nearly as I can figure it in a rapid calculation. And if you do not pick up enough wire at least to give us a good return on the investment, what use is there in making the investment?

General O'CONNELL. We feel sure that the return is worth the investment. Over-all, throughout the Army, we are picking up more wire in dollar value than the cost.

Mr. SCRIVNER. Let us assume that is true; just for the sake of the presentation, what is there about this that makes it cost $1,000? Is it the reel, or the motor?

General O'CONNELL. The complete assembly; the reel, the motor——

Mr. SCRIVNER. Of course, the more motors we get, the more it costs to operate and the more men you have to have to maintain them.

What is the comparison of the cost of your gasoline-driven unit compared to the hand-powered unit?

General O'CONNELL. The cost there is of the order, I would say, of $75 for the hand-driven unit.

Mr. SCRIVNER. In other words, it costs us approximately $975 over and above for the motor-driven unit?

General O'CONNELL. That would be an estimate.

Mr. MONTGOMERY. Every time we pick up approximately 15 miles of wire, we have saved the cost in value of the reel in the value of the wire. The value of 15 miles of wire is slightly greater than the cost of the reel unit.

Mr. SCRIVNER. Still we have to take into consideration the value of the wire and the pick-up, too, to offset that?

Mr. MONTGOMERY. The wire is $87 a mile.

Mr. SCRIVNER. Of course when you do that, you are taking double credit, are you not? You are trying to include the wire saved and the price of the reel at the same time.

Mr. MONTGOMERY. I was trying to point out if we pick-up 15 miles of wire——

General O'CONNELL. That otherwise would not have been picked up.

Mr. SCRIVNER. Yes; but for every mile of wire you pick up with a hand reel, you save 1 mile at less cost.

General REEDER. I wonder if I could turn this back to your experience. As far as use is concerned in peacetime, in laying and recovering in maneuvers, as you know, when the maneuvers are over the communication troops stay behind and start picking up the wire, and the onerousness of picking it up by hand is such that back in 19——

Mr. SCRIVNER. It is the old psychology that everybody likes to go to the picnic, but they do not like to stay and clean up the trash.

General REEDER. That is quite true, but it was onerous enough that it was eliminated 22 years ago.

Mr. SCRIVNER. If that is the primary use, the selling point of the necessity for the war reserve kind of falls by the way?

General REEDER. No, sir. It is also used in war; but as far as to successfully pick it up in war to make pay dirt, it is the salvage companies that get the wire then. The units which are engaged in

operations will use it for laying wire, but it is much more rarely that they pick it up.

I think you have to look at the whole picture. In peacetime it is used over and over again—the wire which is issued for training purposes.

Mr. SCRIVNER. Now you are stressing the value of this unit for rapid laying of wire in combat.

General REEDER. For rapid laying.

Mr. SCRIVNER. And without building up any wire reserve to bring your inventory back up to somewhere near the inventory of RL–26 which you had when Korea broke out, you would need about 3,500 or 3,600. Is that a pretty fair estimate?

General O'CONNELL. Yes, sir.

Mr. SCRIVNER. Is there any contemplated improvement on this item?

General O'CONNELL. Not at the present time.

Mr. SCRIVNER. In other words, you have this in pretty standard form which you find acceptable?

General O'CONNELL. Yes, sir. And it is reduced in size and weight and can go on a jeep.

Mr. SCRIVNER. How many plants are now engaged in making this—just one?

General O'CONNELL. One.

General REEDER. You have not let any contracts yet, but contemplate one line.

General O'CONNELL. One producer is all that will be required to take care of the contract.

Mr. SCRIVNER. Is that based on a 40-hour-week operation, or more?

General O'CONNELL. That is based on a 40-hour week.

Mr. SCRIVNER. Is the number asked for here a full year's output, or more than a year? What is the production rate schedule?

Mr. MONTGOMERY. That would run 1 year's production.

Mr. SCRIVNER. That is, if they could start immediately on the 1st of July?

Mr. MONTGOMERY. No, sir. This would require about 9 months to set up and then would run for 1 year beyond that, which would run us up to the reorder lead time.

REQUIREMENTS FOR FORWARD AREA TANK AND VEHICULAR RADIO EQUIPMENT

Mr. SCRIVNER. Now we come down to the subject we were talking about yesterday. You have this list of items here which you call forward area tank and vehicular radio equipment.

General O'CONNELL. I would like to give a brief description of how the equipment quantities for equipping the Army are computed, in response to your question of yesterday, and I have some charts here which will indicate how that computation is made and indicate the complexity of the computation.

This [exhibiting] represents the organization chart for an armored division. You will note that there are a large number of different type of units—headquarters; headquarters company; signal company; MP company, and so forth. Then we have the reconnaissance battalion with its component parts, engineer battalion, armored infantry battalions, four in number, heavy tank battalion, and three medium

tank battalions, in addition to the artillery and complete make-up of the units.

In general, each type unit has a different table of organization and equipment with its different requirements. I would like to show you how these are computed. As a result of maneuvers and actual tests of the equipment, charts are prepared at the Armored School showing what the needs of equipment will be in each individual vehicle—company commander's car, executive officer's car, and the various staff officers, subordinate commanders, and so forth.

This chart shows how the division headquarters are set up. You will also note that here in this headquarters and in the headquarters of the combat commands and other headquarters in general, the number of AN/GRC–3's—that is the set with two receivers—is larger in number than the number of the less expensive set, which is the one-receiver set. We talked of the tank company commander and the tank platoon commander, and they need the set with a double receiver so that they can listen both ways, and in those higher headquarters the number of large sets predominates.

Also you will note the very large number of vehicles other than tanks in which there are radio installations. I have an over-all summary of that which I will give you later.

Mr. SCRIVNER. Of course, the question arises sometimes whether they are absolutely required, or are just convenient to have.

General O'CONNELL. The answer to that I think is that we have armored division commanders who have armored experience in combat and our requirements are based on experience in World War II, as well as studies that have been made for improving the communications system since that time. They are based on a solid background of experience and the armor places great emphasis on their communications, because they cannot do their staff work or accomplish their planning unless all elements of the staff have communications. They must move in separate vehicles and there must be communication between those vehicles.

These requirements that are made up in this form are put in tabular form and are approved by the Army field forces and then submitted to the Department of the Army for final approval.

(Discussion off the record.)

General O'CONNELL. These quantities vary and, of course, when we get into the tank battalion and tank company and the armored infantry units, we get into the larger quantities of the GRC–4, as you indicated yesterday. In the higher headquarters, combat command, battalion and division, we have a predominance of the 3's and here in the armored Infantry battalion are a total of roughly 2 to 1 of the 4's as compared to the 3's.

(Off the record.)

REQUIREMENTS FOR GRC–3 RADIO SET

Mr. SCRIVNER. Now that we have had that background, let us go to the requirements for each individual set and give us just a short description of it for the record and then whatever numbers you feel should be given off the record for the information of the committee, do that; because we have the numbers on the secret information sheet before us, so that it will not be necessary to put them in the record.

So give us a description now of your GRC–3 radio sets.

(Discussion off the record.)

General O'Connell. The GRC–3 is a tank and vehicular radio set.

(Off the record.)

It is used within the armored division and within separate tank companies.

Mr. Scrivner. What is its approximate range?

General O'Connell. Its approximate range should be off the record. It is a voice set, frequency modulated, and is flexible enough that the components of the set can be combined into a number of different combinations, so that the components can be integrated with the communications requirements, without the necessity for supplying a complete set with all the receivers that could be put on it.

(Discussion off the record.)

Mr. Scrivner. Now, in a lot of the computations it is another one of these assumptions that is not always provable in that, while we base our experience of attrition on past records, that experience is based on a different type of equipment and you would normally assume, at least during the first 2 or 3 years, where you have a better set, a more substantial set, that the attrition rate would not run as high as your experience had previously indicated. So that in some instances, at least, if not all, the assumption we are making on our form 519's gives a little exaggerated picture of the need.

General O'Connell. I think that is a fair assumption. The new set will stand up better than the old.

Mr. Scrivner. Of course if it does not, then we have wasted a lot of time and money on research and development; because R. and D. constantly assure us that as they go through all of their experimentation they try to bring out something that is better, more economical, will not only do a better job but will stand up better in the field. And if they do not, of course, we have been misled in appropriating for a lot of research.

General O'Connell. We are confident it will stand up better in the field. However, on the basis of combat losses, tank burn-outs, and that sort of hazards, this set will be subject to casualties the same as its predecessor.

Mr. Scrivner. Then, as you visualize the situation in field combat, if a tank is ignited you know that even though the hull might be recovered, nearly everything in the tank is destroyed to all intents and purposes.

General O'Connell. Yes, sir.

Mr. Scrivner. And while some may be salvageable, they have to be taken out, reworked, and everything else to be sure that they are workable. In other words, you just cannot afford to take chances. Even though from the outside it looks like there might be some parts of equipment in there that were not completely destroyed, you cannot take chances of leaving them in without being sure they will work. In other words, if you left part in and did not retest it, you might find it did not work and you would have to do all of the work all over again.

General O'Connell. Yes, sir. What is salvaged is put through the maintenance shop, reworked and checked, and is as good as a new set. Any set that comes in for repair would be completely overhauled and tested.

REQUIREMENTS FOR THE GRC–4

Mr. SCRIVNER. Now let us go to the GRC–4.

General O'CONNELL. Here the computation of requirements is done in the same manner as for the GRC–3; the same technique.

(Off the record.)

Mr. SCRIVNER. What type set is this? This is not quite as elaborate as the 3?

General O'CONNELL. This set is similar to the 3 as to its components, but it has one less receiver. The GRC–3 has an extra receiver to enable it to communicate both up and down. This set lacks that extra receiver, hence is less costly than the GRC–3.

Mr. SCRIVNER. This is the one used primarily in the tanks?

General O'CONNELL. And other vehicles.

Mr. SCRIVNER. In vehicles of your armored units?

General O'CONNELL. Yes, sir.

Mr. SCRIVNER. Does this replace any other set?

General O'CONNELL. This replaces directly the SCR–528. The AN/VRC–5 is also replaced by the GRC–4.

Mr. SCRIVNER. What is the inventory on that?

(Discussion off the record.)

Mr. SCRIVNER. These inventories are all as of the 30th of June 1950?

General O'CONNELL. Yes, sir.

(Discussion off the record.)

Mr. SCRIVNER. The attrition rate for the articles similar to this and which this new set replaces shows in the 2 years of 1951 and 1952 a proportion of 2 to 1. On the other hand, the attrition rate on your GRC–3 in those 2 years of 1951 and 1952 shows about 4 to 1. Now why would there be such an increased attrition of the SCR–528?

General O'CONNELL. Because, by and large, it is in the forward front-line tanks.

Mr. SCRIVNER. In other words, the tanks in which this set is being used are those which we would normally talk of as being tanks actually in combat?

General O'CONNELL. Yes, sir.

Mr. SCRIVNER. Whereas these vehicles in which the 508 or the GRC–3 is used would be those of an echelon of command further back from the actual combat, as we think of it?

General O'CONNELL. At the command level, platoon, company, and so forth, where they are somewhat less exposed to enemy fire.

REQUIREMENTS FOR THE GRC–5

Mr. SCRIVNER. Now what about your GRC–5?

General O'CONNELL. The GRC–5 is a member of this same series of tank-vehicular sets for installation in vehicles. This member of that series, the GRC–5, is used by the artillery and is installed in artillery vehicles. It has the same general characteristics, except for frequency band, as the 3 and 4.

(Off the record.)

Mr. SCRIVNER. Does this replace any set now in use?

General O'CONNELL. Yes sir, this replaces the SCR–608.

Mr. SCRIVNER. What was your inventory position on that?

(Discussion off the record.)

Mr. SCRIVNER. Now before we go to the GRC–8, why is there a demand now for three times as many GRC–3's as GRC–4's? Your inventory is fairly comparable and the attrition rate is much lower, and you would normally assume there would be a greater demand for radios in tanks that are in actual combat, as they far outnumber your command tanks.

General O'CONNELL. As you will see by looking at the percentages which are attained by these procurements toward the mobilization level, they are reasonably well balanced.

(Off the record.)

Mr. SCRIVNER. That is one of the things that made me wonder all the more why there are three times as many GRC–3's as 4's.

General O'CONNELL. It is largely the order position. In other words, this quantity will bring us up to a slightly better position in this set than in the other two.

Mr. SCRIVNER. Why do you have to be in a better position on this one? I would have thought it would have been exactly the reverse; that really the one you want to be in best position on would be the tanks you anticipate would be in combat.

General O'CONNELL. That gives us exactly the same components as the GRC–4, with an extra receiver; so that we are actually a little ahead of the game; because with this quantity in this set we have some additional receivers in the hole.

Mr. SCRIVNER. In other words, what you are trying to tell us now is that if you get in a pinch and need more of the radios for your combat tanks, you could, by the elimination of the additional receiver, use the 3 in place of the 4?

General O'CONNELL. Yes, sir. On the other hand, if we have to convert some of the 4's to 3's we would have additional receivers to do so.

Mr. SCRIVNER. Then you would get additional receivers?

General O'CONNELL. Yes, sir.

REQUIREMENTS FOR THE GRC–8

Mr. SCRIVNER. Now let us discuss the GRC–8.

General O'CONNELL. The GRC–8 is another member of this same related series of sets for installation in tanks and armored and unarmored vehicles. It has identically the same look as to components, the same controls, as the other sets we have just been discussing and differs from them in frequency only. The GRC–8 is comparable in the Infantry to the GRC–4 in the armored units, in that it has only one receiver.

(Off the record.)

And here we have need of bringing this set into balance with the other members of this radio group. It is behind at the present time.

Mr. SCRIVNER. Does this replace a presently existing set?

General O'CONNELL. Yes, sir. This replaces the SCR–528 and the AN/VRC–5 and the SCR–510.

Mr. SCRIVNER. What is the inventory of those three?

(Discussion off the record.)

Mr. SCRIVNER. Is the combat consumption figure a firm figure that you received from the field? How do you account for the loss of that many radios?

General O'CONNELL. There are a very much larger number of those three types of sets actually in service than of the other two types.

Mr. SCRIVNER. Yes; I would estimate there would be; but, even so, your proportionate loss is higher, too. What happens to these sets if they become war casualties?

Mr. MONTGOMERY. This is the Infantry set which is receiving the greatest combat. These go in large quantities in the forward area combat, in the jeeps, in the medium tanks, in the light tanks, in the armored cars, and provide the backbone of the forward area of communication.

As General O'Connell mentioned in the case of the GRC–3's and 4's, the GRC–8 is the comparable Infantry set in which the bulk of the activity in Korea right now involves this type of equipment.

General O'CONNELL. The installation of these sets is preponderantly in jeeps, rather than in armored vehicles, and the set does take more of a beating percentagewise than its armored counterpart.

Mr. SCRIVNER. Part of that is due to the fact that you have not yet come up with what you consider a really satisfactory installation that would take care of much of the shock and abuse which these sets would normally get in a jeep.

General O'CONNELL. That is a fair statement.

Mr. SCRIVNER. Which is one of the shortcomings you have overcome in the GRC–8, which will give a set that will withstand more of this beating which they would normally get in a jeep?

General O'CONNELL. Yes, sir. The 528 and the SCR–510 are not waterproof, weatherproof sets; hence, we do have some loss due to the soaking of the set.

Mr. SCRIVNER. What happens to them that they become casualties?

General O'CONNELL. The normal hazards of front-line usage, including many accidents. Jeeps run off the road or off the trails, and the set is mounted rather high in the jeep; so, it is usually destroyed.

General REEDER. Do you not think that you have lost a good many of these World War II sets because they have been shaken to bits over those rough roads?

General O'CONNELL. Definitely, that is a factor. We had, for example, complaints from the First Cavalry Division while I was in Japan that their World War II sets were, as they called them, war weary. That is, they had been shaken to an extent where they were no longer reliable. Sets that have been used that much do have a higher casualty rate than new sets.

REQUIREMENTS FOR THE VRC–6

Mr. SCRIVNER. The next is VRC–6. What is that?

General O'CONNELL. That is vehicular radio communication. This set is a military version of the police set, frequency modulated. It is ruggedized, standard Army-Navy components. It is used by elements such as the MP's for traffic control in the combat zone, where this type of set will do the job and where a set of flexibility and sturdiness of the GR–3 to 8 series sets are not absolutely necessary.

Mr. SCRIVNER. And the price is less than half that of the other sets?

General O'CONNELL. That is right. We make the saving possible, and that is one of the fundamental reasons why this set was adapted for this purpose.

(Off the record.)

Mr. SCRIVNER. Does this replace something that is now in use?

General O'CONNELL. It replaces the AN/VRC–2 set which is now used for this same application.

(Discussion off the record.)

Mr. SCRIVNER. Your VRC–6 is a 24-volt?

Mr. MONTG'MERY. The AN/VRC–6 will either be 6, 12 or 24—interchangeable. That is one of the main advantages. Also it is a more rugged set.

REQUIREMENTS FOR THE VRC–2

Mr. SCRIVNER. How has your VRC–2 stood up? What has been the attrition rate?

Mr. MONTGOMERY. The first production had a very high attrition rate. In fact, of the first 500 sets, as I recall, we had to take back and rework them in order to get them to stand up in jeeps. The VRC–2X's, which we went into, is a ruggedized set which is going into use now, and we hope that it will have about the same life expectancy as the VRC–6.

(Discussion off the record.)

Mr. SCRIVNER. That will give you for this year about 8,300?

Mr. MONTGOMERY. Yes, sir.

Mr. SCRIVNER. Then your 6 will replace your 2X. Your 6 is really an improved version of your 2X?

Mr. MONTGOMERY. Yes, sir.

General O'CONNELL. It replaces the 2's and the 2X's.

Mr. SCRIVNER. So, just now you would not have much of an attrition history on the 2X?

Mr. MONTGOMERY. That is right.

REQUIREMENTS FOR THE VRC–13

Mr. SCRIVNER. What is the range of your VRC–13?

General O'CONNELL. (Off the record.)

These sets are all comparable vehicular sets in their range.

The VRC–13 is one of the family of sets similar to the AN/GRC–3 and 4 and is comprised generally speaking of the same components. It is without two of the components of the GRC–3. It has the same range as the GRC–3, and it is used in the same units, but in different places in the command structure where the two items which the 3 has are not needed, and hence it effects a saving.

Mr. SCRIVNER. It brings the price down about $600?

General O'CONNELL. Yes, sir.

Mr. SCRIVNER. Where are these used?

General O'CONNELL. Within the armored division and tank units.

Mr. SCRIVNER. In the tanks or other vehicles?

General O'CONNELL. Largely the other vehicles.

Mr. SCRIVNER. Is the unit such that if necessary, with the other components, it could be used in a tank?

General O'CONNELL. They are identical.

Mr. SCRIVNER. They are all interchangeable?

General O'CONNELL. Yes, sir.

Mr. SCRIVNER. The difference being in the number of components necessary for the use to which they are directed?

General O'CONNELL. Exactly. Actually they are not used in tanks at all, although there is no reason why they should not be. They go into utility vehicles, personnel carriers, and trucks.

General REEDER. There would be a difference in the mountings.

General O'CONNELL. There are four different types of mounts for these sets, depending upon the combination that you want to use.

Mr. SCRIVNER. Does the VRC replace anything?

General O'CONNELL. Yes, sir; this replaces the 528 which was previously used in the same places where this set will be used.

(Off the record.)

REQUIREMENTS FOR THE VRC–16

Mr. SCRIVNER. Take up the VRC–16.

General O'CONNELL. The VRC–16 is also a member of the armored vehicular series, uses the same components as the AN/GRC–3 and 4, and the VRC–13. It is used by armored divisions and tank units. It is used in tanks.

(Off the record.)

It is used in the ¼-ton, ¾-ton, and 2½-ton truck and armored utility vehicles.

Mr. SCRIVNER. Replacing what?

General O'CONNELL. Replacing the 508—that is, the SCR–508.

(Off the record.)

REQUIREMENTS FOR THE GRC–9

Mr. SCRIVNER. The GRC–9?

General O'CONNELL. The GRC–9 is an Infantry set, man-transportable, lightweight, high-frequency range, used in division, regiment, and battalion. It is not a member of this family of sets but is a separate communication set.

Mr. SCRIVNER. What is the source of the power?

General O'CONNELL. Hand generator. It is used either from a hand generator or from a vibrator power pack installed with a vehicle. I have a picture of that, if you would like to see it.

Mr. SCRIVNER. Do you have any hook-up which will give you electric power?

General O'CONNELL. For a. c. operation?

Mr. SCRIVNER. Yes.

General O'CONNELL. No, sir.

Mr. SCRIVNER. This is primarily a field set?

General O'CONNELL. That is right; it is a field set, on the ground and in vehicles. This shows it with the vibrator power unit installed in the vehicle [indicating photograph].

It replaces the SCR–694, a World War II set which did not have the frequency coverage that this set has, nor was it as sturdy and rugged and waterproof. (Off the record.) We had also bought a forerunner of this set and used the same nomenclature, late in World War II.

(Off the record.)

Mr. SCRIVNER. Why do you anticipate so great an attrition in 1952?

General O'CONNELL. It is a very widely used set and again is up with the forward units. Our actual consumption for the first half of fiscal year 1952 was 1,912, which shows that we are making a saving. It is less than half of our estimated annual consumption.

Mr. SCRIVNER. That is what I was going to comment on. If the present situation continues, there is not any reason why you should anticipate an attrition rate for the last 6 months much greater than for the first 6 months?

General O'CONNELL. If activity remains at a low level, there should be a saving, very definitely.

Mr. SCRIVNER. As a matter of fact, you would expect it to be even less than in the first 6 months, because activity has slowed down at least, if it has not stopped. Of course, every once in a while there is a little flurry of activity.

General O'CONNELL. That is right. We have already made a saving and if activity remains low there will probably be a further saving.

(Discussion off the record.)

REQUIREMENTS FOR THE GRR–5

Mr. SCRIVNER. Take up the GRR–5.

General O'CONNELL. The GRR–5 is a new radio receiver with its power supply for installation in vehicles or for use on the ground.

Mr. SCRIVNER. What is the range?

General O'CONNELL. It is a receiver in the high-frequency band. It receives aircraft-warning signals from the corps warning center and also receives from sets of the antiaircraft unit itself.

Mr. SCRIVNER. And it replaces what?

Mr. MONTGOMERY. The SCR–593.

General O'CONNELL. The SCR–593, also a portable receiver, dry-battery-operated.

(Discussion off the record.)

REQUIREMENTS FOR THE RC–292

Mr. SCRIVNER. The RC–292 is merely antenna equipment, is that right?

General O'CONNELL. Yes, sir. That consists of a mast with insulator on top, and a rod antenna with a counterpoise which extends from the top of the rod. It is for VHF use and includes the metal mast, guys, and so forth, to make a complete unit. It is used for extending the range of these vehicular sets.

Mr. SCRIVNER. Going back to the GR–5, what is your power supply now?

General O'CONNELL. It is a battery, the vehicular battery ordinarily.

PORTABLE RADIO EQUIPMENT

Mr. SCRIVNER. Now we get down to the portable radio equipment.

General O'CONNELL. AN/PRC–6 of which we had a model here yesterday, is the small lightweight handie-talkie used by a front-line infantry unit and armored units.

(Off the record.)

A substantial saving has been made in the actual as compared with the estimated.

Mr. SCRIVNER. What do you mean by a saving has been made.

General O'CONNELL. I mean the actual consumption has not been up to the estimated.

Mr. SCRIVNER. These were the old standard World War II walkie-talkies that are still usable? In other words, they perform pretty well, but this new one is even better, more compact and lighter?

General O'CONNELL. Yes, sir. The old set was in the high frequency band and subject to interference from every powerful station, also to static difficulties and it could not intercommunicate, between the handie-talkie and the walkie-talkie. The new handie-talkie can intercommunicate so that the people out in the platoon can talk to company without having a separate set to do it with.

Mr. SCRIVNER. What does it do, act more or less as a relay?

General O'CONNELL. It can operate as a relay. But he can actually talk directly from his PRC–6 into his PRC–10, the walkie-talkie.

Mr. SCRIVNER. Is the range here better?

General O'CONNELL. The range is rated the same, but actually it gives considerably better than the 536. This set has much higher reliability.

Mr. SCRIVNER. Do you anticipate using up all of your old World War II models?

General O'CONNELL. They have been used up.

Mr. SCRIVNER. At least you are getting pretty close to it?

General O'CONNELL. They have all been used up. We have been supplying Korean requirements and we have had to supply them with the PRC–6 because we did not have any more 536's to issue. There are SCR–536's in the field and they will be used up by the units which have them.

Mr. SCRIVNER. In other words, your inventory included those in Korea and in the hands of the troops?

General O'CONNELL. Yes, sir.

Mr. SCRIVNER. Zone of interior and EUCOM?

General O'CONNELL. Yes, sir.

(Off the record.)

Mr. SCRIVNER. What is your lead time on this?

General O'CONNELL. I believe it is 9 months.

Mr. SCRIVNER. The PRC–9?

General O'CONNELL. This is a walkie-talkie set, a member of the PRC–8, 9, and 10 series.

Mr. SCRIVNER. When we talk of the walkie-talkie—this is carried on the back, on the man's back?

General O'CONNELL. Carried on the back with an antenna coming up on top of the set. It replaces the SCR–609, 610.

(Off the record.)

I do not have the actual consumption on this.

Mr. SCRIVNER. You have an estimated consumption in 1952 almost six times that in 1951. That looks like a pretty sharp jump from 1951 to 1952.

General O'CONNELL. What do you have on that, Mr. Montgomery?

(Off the record.)

Mr. SCRIVNER. Will you furnish for the use of the committee but not for the record, that figure?

General O'CONNELL. Yes, sir.

(The information requested was furnished for the committee files.)

Mr. SCRIVNER. Give us the PRC–10.

General O'CONNELL. This is a companion set to the PRC–9, a walkie-talkie identical in characteristics except for frequency, with the PRC–9. It is used by the Infantry and airborne, all elements of the division, a front-line set.

(Off the record.)

Mr. SCRIVNER. There is an increase of 400 percent. How do you account for that?

General O'CONNELL. I believe there was a similar case here.

(Off the record.)

Mr. MONTGOMERY. The 1951 consumption was limited by availability.

(Off the record.)

Mr. SCRIVNER. That presents a picture of having more consumption in the fiscal year 1951 and 1952 than you had original inventory?

INCLUSION OF REPAIRABLE RADIO SETS IN INVENTORY

General O'CONNELL. We conducted a major repair program in this set, placed a contract with RCA for the repair of several thousand of them.

Mr. SCRIVNER. Which did not show on your inventory?

General O'CONNELL. Was that shown on the original inventory?

Mr. MONTGOMERY. It was supposed to be. Whether it was, I would have to verify. The RCA has repaired about 6,600 of these sets.

General O'CONNELL. We will supply a figure for you on that.

(The information referred to was furnished for the committee files.)

Mr. SCRIVNER. That raises a question now, in how many other instancees are we expected to find repairable sets not included in inventory?

General REEDER. Did you recover some from MDAP that had been shipped to MDAP?

Mr. MONTGOMERY. On this set we borrowed 5,600 which had been sold to MDAP and which were packed and ready for shipment and shipped to Korea.

Mr. SCRIVNER. How many?

Mr. MONTGOMERY. 5,600. We borrowed 1,000 from the Marines and we have constructed in our own depot 2,200 additional sets. We actually set up an assembly line paralleling a manufacturer's assembly line and ran off a batch of 2,200 sets.

General REEDER. Actually you are liable for those 5,600 sets, are you not?

Mr. MONTGOMERY. That is right. We have to repay those to MDAP from the procurement of these sets.

General O'CONNELL. Our position here is the same as it was with the 536 in that we do not have any 300's to issue. We have to make all new issue with PRC–10's. Our depot stock of 300's is completely exhausted, although there are, of course, troop units equipped with a large number of them.

Mr. SCRIVNER. If you have to replace sets with MDAP, you are going to have to replace marines, too, are you not?

General O'CONNELL. Yes Sir.

General REEDER. The National Guard here is shown as a proper requirement but the MDAP 5,600 had been written off the books.

Mr. SCRIVNER. The 5,600 had been deducted from the previous inventory?

General REEDER. That is right.

(Discussion off the record.)

REQUIREMENTS FOR THE GNS–1

Mr. SCRIVNER. Now we move into a different type of equipment, some of which we discussed yesterday. Give us a little information on the GNS–1. This is an entirely new instrument for which there have been no previous requests for funds. Does it replace anything?

General O'CONNELL. This is the first type of this item, although we have had sound-ranging sets previously of widely different design. This set will enable the corps sound-ranging unit to establish a complete sound-ranging set-up by putting microphones out, on a triangle about 500 feet on a side instead of having to run lines 10 miles long between microphones as was done during World War II.

Mr. SCRIVNER. In layman's language this is a device to take the place of the two listening devices so that, inasmuch as they are spread apart, as they receive a sound wave, through your electronic computer you bring in both of those sources of sound and take your converging lines, which gives you an intersecting point, so that you arrive at the approximate location of the source of the sound which would be primarily, as we think of it, gunfire.

General O'CONNELL. That is correct. It can be used for mortars or guns. Of course, the range on locating mortars is much shorter than that on guns.

Mr. SCRIVNER. That would be more difficult?

General O'CONNELL. That is more difficult on mortars. The range is less. It is used for counterbattery work in our own artillery to locate and fire upon the enemy artillery or his mortars.

Mr. SCRIVNER. The unit price, of course, is fairly high. This is practically all electronics?

General O'CONNELL. That is right. It does all the computing for the operator.

Mr. SCRIVNER. That will suffice for the record.

(Off the record.)

Mr. SCRIVNER. You stated one thing there that impressed me and that is the fact that about one-sixth of the proposed procurement is designated as training consumption. I assume that is for 1 year. I do not see how you make that calculation, that one-sixth of them are going to be consumed in training.

General O'CONNELL. We show zero peacetime consumption for 1951–52.

Mr. SCRIVNER. But you said training?

General O'CONNELL. That is a training allowance, except in the first year of the war computation, we show a combat and training consumption lumped together here.

Mr. SCRIVNER. You have not previously requested funds for this. This is the first request for this particular item?

General O'CONNELL. That is right.

Mr. SCRIVNER. When would you anticipate that you would get production after July 1?

General O'CONNELL. There is an 18-month initial lead time.

REQUIREMENTS FOR THE RC–120

Mr. SCRIVNER. The next item is a comparatively new item, is it not?

General O'CONNELL. That is the RC–120, facsimile equipment. Is that the item you have in mind?

Mr. SCRIVNER. Yes. In layman's language, this is a device a great deal similar to that used in newspapers, where they use a central source of supply for news photographs. In other words, they might have a photograph taken of something in New York City, place it at their sending end which is then in turn received on this roller or cylinder at the receiving office and transmitted over wires between the two termini. Is that right?

General O'CONNELL. That is a very good description.

General REEDER. Our equipment will differ in that we will transmit maps rather than photographs and also we would want to transmit over lower grade facilities than commercial.

Mr. SCRIVNER. While that would be its primary use, you could send photographs?

General REEDER. Oh, yes.

REQUIREMENTS FOR AN/GRC–21

Mr. SCRIVNER. Let us take your mobile radio equipment.

General O'CONNELL. AN/GRC–21 is a new high-powered mobile radio set. It replaces the AN/GRC–26 and will provide increased facilities as compared with that set. It has 500 watts of output power and is used as a radio station in combination with other similar sets for Army headquarters, corps, and divisions.

Mr. SCRIVNER. What is the purpose of it? Why do they need it?

General O'CONNELL. It is a radio-teletype transmitter-receiver for high-speed transmission of radio messages. It has a capacity per day of 100,000 groups as compared to a maximum hand keyed capacity per day of 10,000 groups.

The forerunner of this set was put to very important use at the Inchon landings, where it provided excellent communication between the corps making the landing and both Eighth Army and Far East Command Headquarters. A very large number of them were used for that purpose.

Mr. SCRIVNER. Upon who do you base your procurement requirement? This seems to be a rather high number for a set like that.

General O'CONNELL. What we are doing here is to turn off the GRC–26 with the completion of quantities requested in the next second item down, and go into the production of the GRC–21. This quantity is required to keep production going through October of 1954. It is a 16-month lead-time item.

(Discussion off the record.)

General O'CONNELL. I had the wrong figure.

Mr. MONTGOMERY. The figure that you have is right, General O'Connell, the other figure representing an attempt to obtain production from two suppliers, but we were unable to obtain a satisfactory contract with one supplier and therefore the quantity, since the form was made out, was dropped back to that figure.

General O'CONNELL. Rather than the other figure?

Mr. MONTGOMERY. That is right.

Mr. SCRIVNER. What is going to happen to the funds that were allocated for this particular purpose? There would be almost 200 of them at $50,000 apiece. That is pretty close to $10 million. Why could you not carry that over instead of making a request for an additional $7.5 million this year?

Mr. MONTGOMERY. Those funds were expended in increased costs.

Mr. SCRIVNER. On what?

Mr. MONTGOMERY. On other items in the funding program last year.

Mr. SCRIVNER. That seems to be the standard order of procedure throughout. Any time you were not able to get what you told us you wanted the money for, this is what you did. In previous years you have sold this committee on the idea that this was a necessary piece of equipment in order to do what you intended to do and that you had to have money in order to get 378. We were perfectly justified in assuming that, especially since the figures on this sheet were changed only yesterday, the 13th of March—we were justified in assuming that you actually had gotten or intended to go into procurement of 378. Yet we find that you are only going to procure 189 out of previous year's funds and that about $10 million has been transferred to some other activity where costs have increased. I do not know what Mr. Mahon thinks about it, but I know what I am thinking about it.

Mr. MONTGOMERY. I might add that the last portion of the order reverts as an unexpended balance for the fiscal year 1951.

Mr. SCRIVNER. I shall want to see that.

General REEDER. I think I remember about this. Did you not have some trouble in getting this into production as early as you expected?

Mr. MONTGOMERY. Yes, sir.

Mr. SCRIVNER. He just said that they thought they would get two suppliers and got only one.

General REEDER. And you procured more of the 26 which was the interim set?

Mr. MONTGOMERY. Yes. We bought more of the interim set because of that and then we had a certain amount of money still outstanding in some letter contracts.

Mr. SCRIVNER. Why did you not say that in the first place, since you could not get the 21, you continued with the procurement of the 26?

General REEDER. That was the old SCR–399, and so forth.

General O'CONNELL. Without teletype attachment.

General REEDER. Because that was running out, you had to go into the 26 as an interim model. That was in production. The 21 was the one you were not able to get as soon as you expected and as you had to have sets, you increased the number of the 26.

Mr. SCRIVNER. This committee should have information going clear back to scratch to show us what you requested, what you actually procured—I do not care whether it was 26's or 21's; we were told that this new set was the 21——

General REEDER. That is right.

Mr. SCRIVNER. As the record stands you have two conflicting statements. The committee should have the correct information.

Please furnish a statement on that by Monday morning. That will give you plenty of time.

(The information requested is as follows:)

There are no AN/GRC–21's on hand. It is a new set now in first production. There have been no deliveries as yet. We have a quantity of 378 funded in 1952. Procurement action has been taken on all components of 189 of these sets and for the remaining 189 sets, components such as receivers, teletype equipment, trailers, power units, and teletype converters are on order but the transmitters remain to be placed on order between now and June 30.

My previous statement, Friday, was incomplete in indicating that only 189, or approximately half of these sets were on order since the additional component orders to make up the complete quantity of 378 had not been taken into consideration and the figures which I had showed listed only the number of complete sets on contract.

In computing the procurement quantity for the AN/GRC–21, the number of AN/GRC–26 on hand on order and the quantity in this estimate were deducted from the total computed requirements.

Due to the improvements in the AN/GRC–21, we would like to be able to meet all of our requirements for this type of radio set. However, due to the fact that we will be unable to get delivery on this new set until September 1953, it is essential that the production line of the AN/GRC–26 be continued through August 1953 to meet the current requirements of the Army. In doing this, we will get sufficient deliveries of the AN/GRC–26 to cover Korean consumption and peacetime training requirements except for 71 sets.

This is a higher percentage of war reserves than is being provided for other types of radio sets.

(Further information was furnished for the committee files.)

IMPROVEMENT OF TECHNIQUES AND PROCUREMENT PROCEDURES

Mr. MAHON. General Reeder, have you any information for the committee as to the improvement of techniques and procurement procedures that would enable you to get this expensive equipment for the Signal Corps and for Army Ordnance, and so forth, at the lowest possible cost? What has been presented to the committee on that subject?

General REEDER. I do not know that anything has been presented, sir. We are still faced with the problem of making a contract between a willing buyer and a willing seller. We get the willing seller down to the lowest price we can. We protect ourselves, as I think the committee has been told, by the price redetermination clause.

Mr. MAHON. That is helpful to some extent, but I think you would agree that that is not completely adequate.

General REEDER. It is not of immediate help, because we are compelled to obligate sums which frequently we believe are higher than the ultimate price should be.

SLIPPAGE IN PROCUREMENT AND DELIVERY SCHEDULES

Mr. MAHON. Generally speaking, what has been developed in the committee as to whether or not you are up to schedule on procurement and delivery of the items provided for in the fiscal 1951 and 1952 appropriations?

General O'CONNELL. We gave a summary of the rate of obligation of funds for the 1952 money.

Mr. MAHON. The rate of obligation of funds is of interest, but I would like to get a look at the whole picture.

General REEDER. For the Signal Corps, they will obligate all of their money, I think, without any question.

Mr. MAHON. I am not so much interested in that, but the rate of deliveries. In other words, are you getting the stuff in hand to fight with as fast as you estimated you would for the fiscal 1951 and 1952 programs?

General REEDER. No, sir; we are not.

Mr. MAHON. What yardstick could you use in telling us how much you missed the mark in getting goods on the schedules you previously anticipated?

General REEDER. I think you can get a rough idea from the Signal Corps of the miss by the amount of production they will have financed in fiscal year 1954 from fiscal year 1951 and 1952 funds. Normally we would expect to have had a much larger request for appropriation here; but, because so much of the production has been shoved forward by failure to deliver rapidly, they will carry a backlog of half a billion dollars into fiscal 1954 undelivered from 1952 funds.

Mr. MAHON. Does the record show the over-all procurement program of long-lead-time items, such as guided missiles, tanks, and Signal Corps items? Does the record show the picture as to how far behind schedule you are on items to be delivered from fiscal 1951 and 1952 funds?

General REEDER. I would say, as far as the Signal Corps is concerned—and I am just guessing and the production boys can correct me—that we are 6 months behind the goals we originally set to be reached.

General O'CONNELL. I would say, on some individual items which had been particularly difficult in an engineering sense, to get brand-new developed items into production it will run longer.

General REEDER. But, on an average, I would say that.

General O'CONNELL. I think that is a good average.

Mr. MAHON. If you do not already have that information, at least for the committee, I think it ought to be made available to us at some point that would be easy to find.

SUBSTANTIVE AUTHORIZATION FOR BUDGET ESTIMATES

Are you budgeting in this request before us for items that would be dependent somewhat on additional authorization from Congress for, let us say, the activation of new bases?

General REEDER. No, sir; there are no new lines to be established, except where the item has never been in production before.

Mr. MAHON. Let us say the public-works program provides the reopening of certain bases or expanding of certain bases.

General REEDER. I thought you meant production bases.

Mr. MAHON. No; I am getting out of the production field now. What comment would you give on that?

General REEDER. As to whether we will be opening any new troop installations in 1953?

Mr. MAHON. I am not necessarily interested in discussing the bases that might be reopened, but I am interested in asking if you are requesting, at any place in the budget, funds for projects that have not

yet actually been authorized by Congress; for example, maintenance and operation of posts, camps, and stations.

General REEDER. No; none that have not been authorized by Congress. We have nothing of that sort.

(Discussion off the record.)

Mr. MAHON. Is there any area, General Decker, that you know of where you are requesting for any project that has not yet been authorized?

General DECKER. No, sir; there is not.

Mr. SCRIVNER. Before we adjourn, I have two requests I wish to refer to General Decker and have somebody submit a statement. It need not be in the record.

MONDAY, MARCH 17, 1952.

REPORTED THEFT OF MOTOR VEHICLES IN KOREA

Mr. SIKES. The committee will please come to order. Mr. Scrivner, I believe you had the witness when the committee adjourned?

Mr. SCRIVNER. Before we resume with items for the Signal Corps, Mr. Chairman, I should like to make a request for some information and possible action. Over the week end I had occasion to talk to an officer who had just returned from Korea and whose work took him into a great many fields. I gathered from his conversation that we have had a sizable number of military vehicles stolen in Korea, which have been repainted, sold, and are now being used on the streets and highways there. The source of the gasoline to operate them is still something of a mystery. We do not have the answer to that.

Apparently it is rather difficult to identify these vehicles after they are stolen and repainted, although apparently they had a serial number somewhere on the motor block.

This has raised a question in my mind whether any attempt had been made to provide our motor vehicles with a serial number or a mark of some kind which could be found easily, through the use of some kind of paint or stamp on the body that could not be covered over.

Perhaps it would be well if General Decker or General Reeder would check with Ordnance and possibly Research and Development to see if something like that can be done immediately, which would provide much needed relief over there.

(Discussion off the record.)

Mr. SIKES. General Decker, will you provide within the shortest possible time, information concerning the number of vehicles that are being lost by theft in Korea and the steps that are being taken to correct that situation; also, what punishment, if any, has been meted out to anyone who has been found implicated in those thefts.

Also, please provide information concerning any corrective measures that are in the process of being adopted, which will make it more difficult to steal these motor vehicles or other equipment. I should think there should be no great difficulty in stamping into the metal at a number of places some identification which it would be almost impossible to cover up. If a determined effort is made, theft and black-market activities can be stamped out in large part. We should like to have a complete report on that as soon as possible.

General DECKER. I shall furnish it as soon as possible. You understand, Mr. Chairman, we will have to go to the Far East Command to get that information.

Mr. SIKES. I trust that you will cable for the information.

General DECKER. I shall do that right away.

Mr. SIKES. Thank you.

(The information requested was furnished for the committee files.)

SCRAP PROGRAM

Mr. SCRIVNER. May I make a request for another bit of information, to furnish which will perhaps take some time. We all know of the present great need for scrap in the defense effort. We have been told at various times of the efforts being made overseas, east and west, to salvage as much scrap as possible. Would it be proper to ask for a report on the scrap program especially as it relates to Korea, to show how much has been developed and how much of it has been shipped back?

Mr. SIKES. That is entirely in order at this time. Will you look into that, General Reeder?

General REEDER. Yes, sir.

(The information requested is as follows:)

RETURN OF SCRAP FROM KOREA AND JAPAN

1. The present policy providing for the return of ferrous and nonferrous scrap from Korea and Japan, except for fired shell cases, was established in November 1951. Prior to that time ferrous scrap was sold by negotiated sale to Japanese industry until early in 1951, after which time it was sold after competitive bidding for use in Japan or the United States. Fired shell cases ever since the Korean operation started have been returned by the Army to the United States and utilized or sold as material for the procurement of new items. Other nonferrous scrap was reported to the Emergency Procurement Service, General Services Administration, for stockpiling in accordance with the Stockpiling Act. If not acceptable for this purpose, it was sold locally through competitive bidding.

2. The present policy, established in November 1951, provides for the return to the United States for allocation to mills of all heavy ferrous scrap generated in Korea and Japan. Light ferrous scrap is sold locally by competitive bid, as it is not economical to ship and has limited use in the mills. Heavy ferrous scrap is returned to the United States and sold under National Production Authority allocation. Fired cartridge cases continue to be returned to the United States as heretofore. This return of cartridge cases also includes a large quantity in Okinawa, in connection with which the Army has executed a contract for collection and handling, as the material is widely scattered. Other nonferrous scrap available for disposal is reported to the Department of the Army, Washington, for disposition instructions. Determination is made here, first, whether the material can be utilized directly in the United States by the Department of the Army, and, if not, then whether Emergency Procurement Service desires it for stockpiling. If not needed for stockpiling, it is returned to the United States and sold, in the case of aluminum, under allocation by the National Production Authority, and for other materials, by competitive bid. This policy is in accordance with an informal agreement between representatives of Defense Production Authority, State Department, Munitions Board, and the Army. This policy is now being prepared in written form by the Munitions Board, and this directive will include a provision that heavy ferrous scrap in quantities less than 100 tons and nonferrous scrap less than 5 tons need not be returned to the United States but may be sold locally.

3. The Far East Command is now preparing the initial shipment of heavy ferrous scrap, the quantity and date of shipment of which is expected momentarily.

4. The Emergency Procurement Service have advertised for bids on the return of approximately 500,000 pounds of scrap aluminum, brass, and lead scrap in Japan.

5. On February 28, Far East Command was instructed to ship to the United States 1,000,000 pounds of aluminum scrap on Okinawa.

REQUIREMENTS FOR R-390/URR

Mr. SCRIVNER. Mr. Chairman, when we concluded on Friday, we were discussing the items under the title "High-power mobile radio equipment." We had discussed GRC-1 and were ready to talk about A-390/URR radio receiver. Will you proceed, General O'Connell?

General O'CONNELL. This is a newly developed radio receiver, a major improvement over any military or commercial receiver previously available. It has performance greatly superior to that of any previous radio receiver.

(Off the record.)

Mr. SIKES. Is this a new piece of equipment?

General O'CONNELL. It is, Mr. Chairman.

Mr. SIKES. Does it replace one that is now in use?

General O'CONNELL. Yes, sir. It replaces a number of types of receivers now in use.

Mr. SIKES. Is it materially better than the ones now in use?

General O'CONNELL. It is a great improvement over those now in use.

Mr. SIKES. What will be done with the ones now in use?

General O'CONNELL. They will be continued in service, and, as replacement takes place of those receivers with this one, they will be used for other purposes—put in reserve and used for other purposes.

I can give you the procurement status of this. Since it will not begin to come off the production line until December of 1952, we have not computed any consumption taking place during the fiscal year 1952.

(Off the record.)

Mr. SIKES. With this procurement will you begin to phase out the older models?

General O'CONNELL. Yes, sir. We will begin to phase out the older models with the newly produced sets.

Mr. SIKES. Do I understand correctly that there is still a shortage of even the older models?

General O'CONNELL. That is right, sir.

Mr. SIKES. And is this materially better than the set that is now in use?

General O'CONNELL. It is much better.

(Discussion off the record.)

General O'CONNELL. This item has a reorder lead time of 11 months. I have here a photograph of the item.

Mr. SCRIVNER. Did you have any money for this in 1951?

General O'CONNELL. Yes, sir.

Mr. SCRIVNER. For how many?

General O'CONNELL. 4,198; 330 in 1952. 1,100 of these were paid for out of funds which were established for the procurement of complete sets, complete end items which include this receiver as a part of the set. Actually they have been funded in two ways: partly as com-

ponents of major equipment and partly as separate units for intercept purposes.

Mr. SCRIVNER. If there are two of each GRC–21, I would assume they would be part of the set that is costing $50,000?

General O'CONNELL. That is right.

Mr. SCRIVNER. That gives you still more, because you are ordering them as a part of a set with two in each one.

General O'CONNELL. Would you like to have a complete breakdown of the requirements in that, Mr. Scrivner?

Mr. SCRIVNER. I thought that is what you were giving us a while ago.

Mr. MONTGOMERY. The R–390 for the AN/GRC–21's which are on order with previous year's funds and for the AN/TRD–4, which is the radio direction finder, which is on order, using previous year's funds, amounted to 1,116. These are components of the two sets mentioned. There are two receivers used in each set.

In order to establish your source of supply, since the item had not been procured before, we placed one bulk order for our end-item requirements for the set and for the receivers which were required to be assembled by another manufacturer into the equipment, since there was no source at the time we were placing the contracts for the manufacture of the other end item, the GRC–21 or the AN/TRD–4—there was no established source for him to go to to secure these items.

It also had the advantage of giving us one bulk procurement and to obtain one item which from a maintenance standpoint would be identical, whether it was a component of the set or whether it was bought independently. So that there would be no question of interchangeability of parts, one type of part would maintain it whether it was in the equipment or in its use as intercept equipment.

Mr. SCRIVNER. There is not any argument about the logic of that. The more identical units you can get like that, the simpler your maintenance operation and spare part problem is going to be.

(Off the record.)

REQUIREMENT FOR HAND KEYED AND RADIO TELETYPE SET

Mr. SIKES. Take up the next item, General?

General O'CONNELL. The next item is also a high-powered mobile radio set. I have photographs of it here.

Mr. SIKES. What do you do with it and why do you need it?

General O'CONNELL. It is a hand keyed and radio teletype, radio set used in the higher headquarters of the Army, corp and division.

Mr. SIKES. What does it replace?

General O'CONNELL. It replaces the SCR–399.

Mr. SIKES. Is this a new set or is it now in production?

General O'CONNELL. It is in use.

Mr. SIKES. It is in field use?

General O'CONNELL. Yes, sir; and in production.

Mr. SIKES. Is this a new model of the set now in use or simply a continuation of the order?

General O'CONNELL. It is simply a continuation of the order. This set will be ultimately replaced by the GRC–21, which we previously discussed, when that set comes into production.

Mr. SIKES. Then why do you need this order at this time?

(Discussion off the record.)

Mr. SIKES. How do we know that you are not getting too many of these, more than you actually need?

General O'CONNELL. These requirements are computed on the form 519 and are based on the tables of organization and equipment.

Mr. SIKES. How do we know and how do the people who are going to read this record know that you do not have enough of these sets at this time?

General REEDER. This is a peculiar case. I happen to be familiar with it because I scratched my head over it a little bit.

There are three sets altogether, the old one, the 399, which was not completely used up; the 6RC–26 which had to be procured because they were short currently and for which we had to continue procurement for a time until the 6RC–21 comes in. The total demand is figured against the three sets so that you do not throw away any of the older sets in favor of the newer ones coming in.

Mr. SCRIVNER. When are you going to get your production on the GR–21?

(Discussion off the record.)

Mr. SIKES. Is any part of this order for war reserve or is all of it for present-day use?

General O'CONNELL. All of this is for the equipment of the Army; none for war reserve on this item.

Mr. SCRIVNER. It does not sound logical to me when you start talking about the GRC–26, because my recollection is that you told us last week that it was to be replaced by the GRC–21. Unless there is some other moving reason that has not yet been shown, it is difficult for me to understand why you should continue the production of the GRC–26 when you have the 21 coming in which, as described to us, is so much superior—and it should be, because it costs 2½ times as much. This is especially true when the number here requested is only a small quantity, although the cost is $1,860,000, and especially in view of the fact that out of previous year's funds you are procuring a large quantity.

Now here is an item representing less than 10 percent of that number and an older item, with a newer one coming into production. It is difficult to understand why the Army could not get along with the quantity that you procured with previous year's funds.

General O'CONNELL. We do not feel, Mr. Scrivner, that it is warranted to lapse that production line on these sets which is one of our mainstays at the present time, an extremely important set for higher headquarters operation, until we have actually established a production line for the new set.

Mr. SCRIVNER. If they can stretch out aircraft production and tank production, it does not seem that it would be too difficult a job to stretch out this 1,003 order a little, and get your 21's instead of these older and less efficient 26's.

General O'CONNELL. I think we are now in the realm of speculation as to how much of a calculated risk we are willing to take.

Mr. SCRIVNER. Every figure that has been given us since the first day these hearings began was based on a great deal of speculation.

General O'CONNELL. That is right, Sir.

Mr. SCRIVNER. Some of which is warranted and some of which may be unwarranted. But it is all speculation. Everybody realizes that

and knows that if all of the speculative bases upon which we computed some of these figures prove false, we will be spending a lot of money for equipment that will be sitting around in warehouses or out in the open for a long, long time. On the other hand, if some of the other speculations prove false we may find ourselves needing this stuff a whole lot sooner than now seems apparent.

General O'CONNELL. That is right.

Mr. SCRIVNER. So that either way, it is a speculation, it is a gamble. I might not want to gamble as much on ammunition, or some other items, as I would on other items. Here is an item that, as you have told us, is used at the army, corps and division level, for which you have already received funds to procure a quantity. This item before us involves only a few, but it will still take quite a number of Savings Bonds to pay for them. It is one of those items that would not disturb me too much if we were to speculate on stretching our your line of production just a little.

Are the same peple making this who are going to make the 21?

General O'CONNELL. Parts of it. However, the components are made by a large number of manufacturers. The receivers will be made in part by the same manufacturer who is going to make the 390 receiver for the GRC–21; the teletype equipment will be made by a different manufacturer.

Mr. SCRIVNER. Will you be able to use the R–390 with the 26?

General O'CONNELL. We would be able to but we will not get it in time to use any substantial quantity of them.

Mr. SCRIVNER. Looking at the anticipated production and the reorder time I should not anticipate that they would be included with the 26.

General O'CONNELL. It is not planned to use them with the 26.

Mr. SCRIVNER. My point is, simply by getting the 21 which will incorporate the 390 which has been described to us as a great improvement over the other items of Signal Corps equipment, that you would not be hurt too much.

General REEDER. Then you ought to move the 93 over into the 21.

Mr. SCRIVNER. What 21?

(Off the record.)

Mr. SCRIVNER. You are going pretty high in the mobilization reserve in your figure.

(Off the record.)

General O'CONNELL. I would like to say this off the record, if I may.

(Off the record.)

Mr. SIKES. Take up your next item, General?

General O'CONNELL. The next item is also a radio set, a high-powered radio set.

(Statement off the record.)

Mr. SIKES. What is your next item?

MOBILE COUNTER MORTAR LOCATOR

General O'CONNELL. The next item is a mobile counter mortar locater. We have discussed this previously. I would be glad to go over it again, if you like.

Mr. SCRIVNER. I do not think we went into it in any considerable detail.

(Discussion off the record.)

Mr. SIKES. Is it practicable for field use or is it so complicated that it requires a lot of care, a lot of repair, and will be difficult to operate?

General O'CONNELL. We have spent about 3 years in making this unit simple and rugged for field use and in changing the design, and the service tests which the unit has passed indicate that we have it.

Mr. SIKES. How many men are required to operate it?

General O'CONNELL. It takes two operators and they have to be relieved, so that it takes a crew of six to operate the set for a 24-hour period.

Mr. SIKES. What is the range? Is it used in the forward areas?

General O'CONNELL. It is used in the forward areas.

(Off the record.)

Mr. SIKES. Mr. Scrivner, have you any questions?

Mr. SCRIVNER. No questions; the questions I had were answered in the previous presentation.

Mr. SIKES. Take up your next item, General?

REQUIREMENTS FOR TPS–1–D

General O'CONNELL. The next item is a radar set designated as the TPS–1–D. It is designed for early warning of approaching aircraft and is used by antiaircraft artillery units.

(Off the record.)

Mr. SIKES. What is that in terms of what we are already familiar with? I notice that quite a number have been already funded.

(Off the record.)

Mr. SIKES. How much did the other one cost?

Mr. MONTGOMERY. At the start of production the cost was $50,000 and at the end of production, in World War II, the price was down to $37,000.

(Off the record.)

Mr. SIKES. How does this fit into the radar fence?

General O'CONNELL. This does not fit into the radar fence. It is a tactical set which has been brought down to much smaller size and lighter weight, than the type of equipment they are using for early warning in the radar fence.

Mr. SIKES. Where does this fit in? What is the purpose of it?

General O'CONNELL. It fits in with the antiaircraft units, at battalion level. It would also be used by guided-missile battalions.

Mr. SIKES. Can it be considered a duplication of the radar fence?

General O'CONNELL. It is definitely not a duplication of the radar fence. The antiaircraft battalion must have these early warning radars in order that they can assign their guns to the targets for the maximum length of time.

(Off the record.)

This enables your battalion commander to assign his guns to incoming airplanes before they are picked up by the gun-laying radar.

Mr. SIKES. How much warning will this give, assuming that you are dealing with jet bombers that have a speed of 500 miles an hour?

General O'CONNELL. This should be off the record.

(Off the record.)

Mr. SIKES. How did you determine the number that you needed?

General O'CONNELL. On the basis of the number of units that have to be equipped, Mr. Chairman.

(Discussion off the record.)

REQUIREMENTS FOR RADAR HEIGHT FINDER

Mr. SIKES. The next item?

General O'CONNELL. The next item is also a radar set. This is a height finder which is used to obtain the height of aircraft. It is used by operational centers of antiaircraft brigades, groups, and battalions in designating targets to their subsidiary groups. The TPS–1–d does not give height information, and it is an important element in target estimation to have the height of the incoming planes.

Mr. SIKES. Is it not possible to devise a set that will give height figures as well as give the other information that is required?

General O'CONNELL. It is possible to do so. However, compromises have to be made in doing so with increased weight, portability, and all that sort of thing, and we have not adopted a radar which will do it.

Mr. SIKES. Obviously you do not propose to have one of these beside each of the warning sets; so how do you determine where you need the height finders?

General O'CONNELL. They are needed at each operational center.

Mr. SIKES. But you are not buying enough for that.

(Off the record.)

Mr. SIKES. It seems they are going to be spread too thin to give any material service. I presume you do not agree with that, since you have settled on this number to request. But the fact that aircraft may be flying at one height in one area may have nothing whatever to do with the height aircraft are flying in another area, and, with the sum of these you are requesting, how are you going to have accurate area information on the height at which planes are flying?

General O'CONNELL. It is not necessary to have one of these at each battalion as it is with the TPS–1–d. Wherever the consolidated information is being furnished to battalions by the operational center, one of these sets can do the job.

Mr. SIKES. Can do the job for that particular area?

General O'CONNELL. Yes, sir. That is right.

Mr. SIKES. But you do not know that the aircraft is going to hold that same altitude throughout the area. How do we know this is not a waste of money for costly, useless gadgets?

Mr. MONTGOMERY. The computation of requirements is based, as General O'Connell mentioned, on the number of operational centers which are attached to the antiaircraft brigade group or separate battalions for some of the detached missions requiring an operation center with the necessary plotting equipment.

(Off the record.)

Mr. SIKES. My point is simply this: You are not asking for many of these sets; so that if Washington can say to Pittsburgh, "We believe airplanes are approaching in your direction at such and such a height," the airplanes may or may not be at that altitude when they get to Pittsburgh and, if there are not enough of these things to go around, I do not see how the information Washington gives about the altitude at Washington is going to be of much value at Pittsburgh.

(Discussion off the record.)

General REEDER. This operates on sweep rather than tracking.
Mr. SIKES. What is the next item?

REQUIREMENT FOR RADAR IDENTIFICATION SET

General O'CONNELL. The next item is an identification set for radar identification.
(Discussion off the record.)
Mr. SIKES. How susceptible is this equipment to jamming?
General O'CONNELL. It is susceptible to jamming, as is any electronic equipment. It is difficult to give you a relative figure. It does have directional antennas which give us considerable protection from jamming signals from outside the area.
Mr. SIKES. Is this model now in use?
General O'CONNELL. It is not in use at the present time.
Mr. SIKES. Is it for reserve or for field use?
(Off the record.)
Mr. SIKES. Did you follow the same means of determining the number needed?
General O'CONNELL. The same means.
Mr. SIKES. Since you do not have them now, why are they necessary for the future?
(Off the record.)

REQUIREMENTS FOR RADAR SEARCH CENTRAL EQUIPMENT

Mr. SIKES. What is the next item?
General O'CONNELL. This is a radar search central equipment which provides shelter for the radar set, the TPS–1D previously discussed.
Mr. SIKES. Is this the shelter only?
General O'CONNELL. Shelter only, with the cabling.
Mr. SIKES. Is it portable?
General O'CONNELL. It is portable; it can be put on a truck and transported and then put on the ground on location.
Mr. SCRIVNER. Your members of this go right along with the TDS–1D?
General O'CONNELL. There is a difference of 10 to take care of the 10 sets of another type which have been procured in fiscal year 1952 for special test purposes.
Mr. SIKES. What is the next item?

REQUIREMENTS FOR RADAR IDENTIFICATION SET, MARK X SYSTEM

General O'CONNELL. This is another radar identification set in the same system as the Mark X system which will shortly be put into effect. This particular equipment is used with the radar set T–37, the gun-laying radar set, similar to the way in which the TPX–19 is used with the 1–D radar set. It provides the same type of identification with the same system and is for the same purpose but applied to a different radar set. You will note it costs more than the TPX–19, because the TPX–19 is able to use the same antenna system as the radar set and combine the two purposes in one antenna. Here this cannot be done because of the wide separation in frequencies between the gun laying antenna and the IFF antenna.
Mr. SCRIVNER. In other words, this one needs its own aerial?

General O'CONNELL. Yes, sir. This one needs its own aerial. Your aerial has to track in synchronization with the T–33 aerial and must be synchronized with the antenna structures, motors, and so forth. This accounts for the increased cost of this equipment over the other type.

Mr. SIKES. What is the next item?

REQUIREMENTS FOR TEST FIRING BEACON

General O'CONNELL. The next item is a beacon which is an essential component of all rockets and missiles which are fired for test purposes. This beacon is installed in the missile or rocket which is then tracked by the radar set or series of radar sets in a given area. The radar set transmits the signal to the beacon, which responds with another signal, which enables ballistic information to be obtained during the flight. It also enables the proving grounds personnel to turn off the fuel in case there is a malfunctioning of the missile. This beacon gives an instantaneous location of the flying missile and, if it heads off its plotted path, you can cut off the fuel and stop it. Also, it provides ballistic information of the height, travel, speed.

Mr. SIKES. Has it been fully tested?

General O'CONNELL. It has been in previous firings. These, I might say, have to be modified to meet specific requirements.

Mr. SCRIVNER. Why this number?

General O'CONNELL. This is to meet Ordnance requirements for the missiles they intend to fire during 1953 and part of 1954.

(Discussion off the record).

Mr. SIKES. What is the next item?

REQUIREMENTS FOR AIRPLANE RADIO SETS

General O'CONNELL. The next item is the newly developed Air Force radio set which is designed for installation in Army aircraft. We have had some discussion on this previously.

Mr. SCRIVNER. Yes; but I think there was supposed to be some further information tying this into procurement and inventory which you did not have at that time.

General O'CONNELL. We have that now, and I will be glad to go into that with you.

Mr. SIKES. Very well.

General O'CONNELL. It is for installation in Army aircraft, in airplanes L–19, 20, 23, and 126 and helicopters 13, 19, 21, 23, and 25. It will not go into the L–5 and the older type aircraft back of the L–19.

It provides the necessary components to work with the Air Force fields and beacons, marker beacons, and radio range equipment. It also provides components to work with ground troops, working with the ground sets in the frequency modulated band which they use.

Mr. SIKES. How did you determine the number needed?

General O'CONNELL. In accordance with the number of aircraft which we compute will be on hand and produced as of June 30, 1954. I have the computation here which shows those figures for this type of aircraft and which shows the delivery as of March 1.

(Discussion off the record.)

Mr. SIKES. What kind of radio sets are now being used in liaison aircraft and helicopters?

General O'CONNELL. A commercial type of radio equipment which provides VHF landing field facilities and low-frequency beacon and weather facilities.

Mr. SIKES. Do you propose to replace your entire inventory?

General O'CONNELL. Yes, sir; we will have to replace our entire inventory because of a change by the Air Force. At the present time it is necessary to make improvised installations of ground sets in the aircraft in order to provide air-to-ground communication between artillery aircraft, the field artillery battery or battalion. This will provide a set for that purpose which is more suitable.

Mr. SCRIVNER. We went into this previously, as far as the type of set is concerned, and these figures are supplied at the request to set out the grounds on which they compute their requirements.

I have no further questions.

Mr. SIKES. What is the next item?

REQUIREMENTS FOR GROUND-TO-AIR COMMUNICATION SETS

General O'CONNELL. This is a radio set required for installation on tanks and other vehicles for ground-to-air communication with comparable sets installed in tactical aircraft.

Mr. SIKES. Does this take the place of sets now in use in vehicles on the ground?

General O'CONNELL. Yes, sir; it takes the place of the set designated as ARC–3.

Mr. SIKES. Does the ARC–3 permit the same general use function as the ARC–27?

General O'CONNELL. Again we are involved in a major frequency change which the Air Force is making from the very high frequency band.

Mr. SIKES. Is that change now in process throughout the service?

General O'CONNELL. Yes, sir; that is now in process throughout the service.

Mr. SIKES. And is that the principal reason for the modification of the radio sets?

General O'CONNELL. It is the principal reason for the modification of the radio sets; yes, sir.

Mr. SCRIVNER. No questions.

Mr. SIKES. What is the next item?

REQUIREMENTS FOR RADIACMETER

General O'CONNELL. The next item is a radiacmeter. It is designed to be carried by a squad leader. It is an electroscope device which takes the static charge, and that static charge keeps the quartz fiber separate at a distance from the insulated rod. When it is exposed to gamma radiation, the charge leaks off due to the ionization of the gas in the chamber, enabling the quartz fiber to come closer to the insulated rod. There is a scale in here, and as the quartz fiber moves closer to the insulated rod, it shows you how much radiation that particular squad has been exposed to.

(Discussion off the record.)

Mr. SIKES. Are they of simple and durable construction, so that they can be depended on to give good service?

General O'CONNELL. They have been tested, and they are better than any device which has previously been brought forth on this subject.

Mr. SIKES. Is the unit cost of $156 a fair cost? It seems high for the kind of thing you are talking about.

General O'CONNELL. We expect to bring that cost down, but deliveries have not started yet and will not start until April. We have not been through any redetermination of any contract of this type. We feel, also, that the cost is high, and we want to bring it down.

(Discussion off the record.)

Mr. SCRIVNER. What is the inventory on this item?

(Discussion off the record.)

General O'CONNELL. Deliveries are to start in April. This item has slipped back in production by several months. We did anticipate 1952 consumption of the item, but this has not taken place so far.

Mr. SCRIVNER. That changes the picture all the way around.

General REEDER. This is a new thing with which they have had no real experience as to how long it will last, and they have used a factor for a straight actuarial computation which indicates a life of about 12 years for this item. Before another budget request is made, we will have some experience data as to whether it holds up or not.

Mr. SCRIVNER. Now, the question occurs in my mind of why one to a squad.

(Discussion off the record.)

Mr. SCRIVNER. I have listened to the discussion; I have listened to the proposed assignment of one to a squad leader, and that assignment, to me, does not stand up too well. I am just curious as to how this assignment was determined. This is a new thing. A squad covers a comparatively small area. The squad leader has innumerable details to look out for. Just explain to me why one to a platoon would not be sufficient rather than one to a squad.

General REEDER. We will get that answer for the record by the people who are supposed to know.

Mr. SCRIVNER. The cost of each item is not great, but in view of the large number of items requested, I think additional information should be supplied.

General REEDER. We will get the answer from the people who are supposed to know. The Signal Corps is just the procurement agency.

(The information requested is as follows:)

BASIS OF ISSUE FOR RADIACMETER IM-61()/PD

The basis of issue for radiacmeter IM-61()/PD is as follows: 1 per chemical or unit gas officer; 1 per chemical or unit gas NCO down to include company level.

On March 19, 1952, Headquarters Army Field Forces was informally requested to review this basis of issue to determine that a radiacmeter of this type is required in this concentration. A discussion was held at Headquarters Army Field Forces among the signal officers, the chemical officer, two representatives of the Surgeon's office, and a representative of G–3 plans. This group reffirmed the requirement for a radiacmeter for each gas officer and gas NCO down to company level and were in agreement that a concentration of four radiacmeters per company was not excessive.

The reasons for this decision are as follows:

(*a*) Department of Army plan for radiological defense defines duties of unit gas officers and unit gas NCO's as they pertain to radiological defense. These duties cannot be performed without a suitable radiacmeter.

(*b*) Fewer items than four per company would not allow for patrols being sent out from the company into possible areas of radioactivity. This is only item available to patrols for determination of amount of radiation to which the men are being exposed.

(*c*) For an item of this size and type used in combat at company level, some provision must be made for loss and breakage. Because of the importance of this phase of combat, the ability of the patrol or company must not be impaired by nonavailability of a radiacmeter.

(*d*) Provisions must be made for the loss of personnel carrying or wearing the radiacmeter. If a single individual in a company or even patrol who is carrying the radiacmeter is lost, no knowledge or record would be available.

The requirements were computed on this basis.

REQUIREMENTS FOR BATTERY-POWERED RADIAC DETECTOR

Mr. SIKES. What is the next item?

General O'CONNELL. The next item is another radiac detector, a battery-powered device, and it is used to charge the insulated rod of the dosimeter we have just been talking about. This dosimeter is inserted in the chamber in this radiac detector, the PP–630, and there is charged to the point where the meter reading is zero, and after each exposure to radiation the IM–61 detectors must be recharged with this device.

Mr. SIKES. After each reading?

General O'CONNELL. After each reading, to bring the reading back to zero, you have to put it in this device and recharge it. It restores the charge which has been removed by the effect of radiation.

Mr. SIKES. What will be the method of distribution of the detectors; who will have them?

General O'CONNELL. They will be at the higher headquarters, at the company level, and also in medical units throughout the field Army.

Mr. SIKES. Have they been thoroughly tested and found practicable for use?

General O'CONNELL. They have been tested and found practicable for use.

Mr. SCRIVNER. In view of some of the information developed relative to the IM–61, I feel we should have more information on this.

General REEDER. On the basis of issue?

Mr. SCRIVNER. Yes, as prepared and established by the field forces.

Mr. SIKES. Will you see that that is provided for the committee?

General O'CONNELL. We will provide that.

(The information requested is as follows:)

BASIS OF ISSUE FOR RADIAC DETECTOR CHARGER, PP–630()/PD

The basis of issue for radiac detector charger, PP–630()/PD is as follows: 1 per company for IM–61()/PD requirements; 1 per laboratory or maintenance shop for IM–9()/PD requirements. This is the current basis of issue for AFF.

In March 1952 Headquarters AFF informally reaffirmed this basis of issue pointing out the following facts:

(*a*) After exposure to any amount of radiation up to 50 Roentgen, the IM–61()/PD will be read and probably recharged. This operation may be performed by unit gas personnel several times a day.

(*b*) It is not practicable to depend upon one company's making use of the charger PP–630()/PD assigned to another company or unit since on extended frontages companies and even larger units are not always compact.

Mr. SIKES. What is the next item?

General O'CONNELL. That completes the hardware items on procurement. We have additional items of first destination transportation, $9,280,000.

Mr. SIKES. What is that for, and how is is determined?

General O'CONNELL. That is determined as a percentage of the dollar value of the items which will have to be shipped during fiscal year 1953. We have found by experience that two percent of the dollar value of our deliveries is the normal cost of shipment from manufacturer's plant to the depots, and this is based on the estimated delivery of $464,000,000 worth of equipment during 1953—procured, of course, with previous fiscal years' money.

Mr. SCRIVNER. My recollection is that some of these cost figures given to us included transportation to the first point of delivery.

General REEDER. In this appropriation we only estimate the cost for that which is to be delivered in the fiscal year.

General O'CONNELL. In this project we have not figured in the unit cost of the items the cost of transporting them from the factory to our depots. In the case of the Signal Corps, we have not done that.

Mr. SCRIVNER. If you have not and others have, then, of course, we get a rather distorted picture. From my point of view, I do not know why you should make one presentation and another service make another. It may be that is was in some other one of the technical services we were told the cost included transportation to the first place of delivery, but I thought it was in connection with some of these larger items. Whichever maker is proper should be uniform.

General REEDER. Ordnance carries it right in the item; the Signal Corps does not.

Mr. SCRIVNER. As a matter of presentation to this committee, why should not all of them make the same kind of presentation?—so that it would be similar in each case.

General REEDER. They probably should. This is a little more accurate way of doing it, because the cost of transportation is included as the actual expense occurs. This is the fiscal year's cost as related to the particular item.

Mr. SCRIVNER. As opposed to the projected cost?

General REEDER. Yes, sir. It does not make any difference in the end.

Mr. SCRIVNER. It does, too, in the amount of money we are called upon to appropriate. And, of course, when it is included in the item cost, it does not give quite a clear picture of the cost of the item itself. And, as everybody should be well aware now, the item of transportation is one of the items which is getting completely out of hand.

As far as the Signal Corps is concerned, then, none of the contract prices you have quoted include the cost of the transportation of the end item to the first place of delivery in the hands of the Signal Corps?

General O'CONNELL. That is right, sir.

Mr. SCRIVNER. In any of your contracts?

General O'CONNELL. In none of the contracts for the purchase of this type of item in this appropriation.

Mr. SCRIVNER. So, for that reason, you are making a request here for $9,280,000 for transportation of things to be delivered to the Signal Corps during fiscal 1953?

General O'CONNELL. That is right, sir.

Mr. SCRIVNER. How much did you ask for in 1952?

Colonel PENCE. $9,049,000.

Mr. SCRIVNER. How much have you actually expended? What is your latest date as to which you can give us that?

General O'CONNELL. We will get that for the record.

Mr. SCRIVNER. That ought to be a fairly current figure if you asked for it in the same way to pay transportation for items to be delivered in 1952.

General O'CONNELL. We will get that.

(The information requested is as follows:)

As of February 29, 1952, there had been expended $3,250,311 for first destination transportation. However, whereas deliveries for February were approximately $52,000,000 it is anticipated that this rate will increase and reach some $82,000,000 in May and June this year. It is also to be noted that there is a lag of from 3 to 4 months from the time the goods are delivered until the transportation bills are paid.

SERVICE-TEST MODELS

Mr. SCRIVNER. Have you given us any information at all about these service-test models? Is that a firm figure?

General O'CONNELL. That is a firm figure. There are 41 different types of service-test models in there covering a wide range of equipment.

Mr. SIKES. Can that be supplied for the record, or is that a secret list?

General O'CONNELL. It is a secret list.

Mr. SIKES. Then it will not be put in the record, but you are supplying a copy of it for the committee?

General O'CONNELL. That is right, sir.

Mr. SIKES. How do you determine what the cost of these items will be?

General O'CONNELL. They are estimates in some cases, and in other cases, where we have been in negotiation with the manufacturer, they represent the results of initial negotiations that have been conducted with him.

(Discussion off the record.)

Mr. SIKES. Is there anything else, General?

General O'CONNELL. I have nothing more, sir.

Mr. SIKES. Does that complete the Signal Corps procurement?

General O'CONNELL. Yes, sir.

Mr. SIKES. I want to thank you and the members of your staff for the presentation.

General O'CONNELL. I appreciate your hearing.

MINIMUM REQUIREMENTS FOR CONTINUATION OF PRODUCTION BASE

Mr. SIKES. General Decker, I would like for you to begin to explore one field of information for the committee. I would like for you to determine how long—that is, up to what date—you would be able

to keep the production lines going at a minimum economical rate at this time on a number of your principal items of procurement with the funds that have already been appropriated in prior budgets, and let me have that as soon as you can for information purposes.

General DECKER. Let me make sure I understand that properly. Utilizing funds currently available, how long could we keep production lines going at a minimum economical rate, regardless of any other requirement?

Mr. SIKES. Right—on several of your more important items, so that we can determine what fix you are in on some of these Signal Corps items. Pick out a few of the principal items all along the line and let us see what kind of a picture we get.

General DECKER. Yes, sir.

(The information requested was furnished for the committee files.)

Mr. SIKES. Thank you, gentlemen.

CORPS OF ENGINEERS PROCUREMENT AND PRODUCTION

Mr. SIKES. General Nold, we are glad to have you back with us. Are you ready now to tell us about the requirements of the "Engineers" for procurement and production for the fiscal year 1953?

GENERAL STATEMENT OF THE DEPUTY CHIEF OF ENGINEERS ON PROCUREMENT AND PRODUCTION

General NOLD. Mr. Chairman, I have a short general statement.

Mr. SIKES. You may proceed.

General NOLD. The "Engineer" portion of the procurement and production estimate for fiscal year 1953 is $74,409,000 or only a little over 2 percent of the entire estimate.

The most significant program in this appropriation in which the engineers are requesting funds for fiscal year 1953, is program 1500. Other major procurement, where we have 88 percent of our funds. Our request for these funds is basically to meet peacetime operating costs through fiscal year 1953 where items cannot be supplied by drawing from war reserves. Of the $65,659,000 in this program over $43 million are for these costs and the balance for required war reserves. Since you have already heard the guided-missile program, I would like to point out that 42 percent of the funds in this program are for the procurement of liquid oxygen generators and tank trailers necessary for the support of the guided-missile program.

(Discussion off the record.)

The balance of the Corps of Engineers' funds in the procurement and production appropriation is split almost equally between program 1200 Noncombat vehicles, and program 1300 Electronics and communication equipment.

Program 1200 consists of only five items insofar as the Corps of Engineers is concerned. The trailers and semi-trailers listed in the budget are for use in transporting such engineer equipment as tractors and cranes, and the 2½-ton bolster body truck is used for transporting bridge equipment.

Program 1300 is the electronics portion of the Corps of Engineers responsibility and contains two types of mine detectors and an infrared monocular. The PRS/3 detector is used to detect metallic mines

both on land and under water, while the PRS/4 is used to detect nonmetallic mines.

(Discussion off the record.)

This has been a general statement of where the bulk of our funds are contained in this appropriation and brief reasons why they are needed.

Lieutenant Colonel Eisiminger and Mr. Kallio, Chief and Deputy, respectively, of my Military Supply Requirements Branch are here to answer any detailed questions you may have.

BASIS FOR REDUCING NUMBER OF PROCUREMENT ITEMS FOR ENGINEERS

Mr. SIKES. Will you tell us either on or off the record something about the basis on which you were able to reduce the number of items for which funds are required for the fiscal year 1953 to 21?

General NOLD. Generally speaking, that came about through an analysis to meet a reasonable budgetary ceiling. It was analyzed to determine what types of equipment, in the first place, might be considered readily available on the advent of war from commercial sources and on which you might afford to delay procurement; and secondly, by not building up the reserve too rapidly, only sufficiently to provide a mobilization base on the combat items, those that had a very long lead time for procurement.

Mr. SIKES. How could you determine when you had struck rock bottom, below which you could not further reduce?

General NOLD. I do not think I can answer that, Mr Chairman. I do not know that any of our group can answer that.

Mr. SIKES. Then how did you determine where to stop?

General REEDER. I think it was done for you, General Nord.

General NOLD. That is correct.

General REEDER. I am afraid I am the responsible character.

Mr. SIKES. Do you think it would be well for us to take up where you left off and reduce this by a few more?

General REEDER. No, sir. I think we have gone as far as you had better go; in fact, I think we have already gone further.

Mr. SIKES. What are some of the items that you are not requesting?

General REEDER. Bulldozers, air compressors, snowplows, cranes, all of which experience would tell us should be in some quantity in war reserve, because the incidence of war in the past has brought a quickening of the civilian demand in order to support the war effort, at the same time that the war was demanding them.

I had the experience of being where those things were critically short. They began coming into India in the fall of 1943. They were asked for far earlier. They were about a year late in being supplied. The Ledo Road which had made no progress at all in about a year, just leaped forward when General Pick and some equipment and some troops arrived in the fall. He made about 90 miles in 2 or 3 months where they had gone 10 or 15 miles in the previous 6 months or so.

We are taking a chance here.

Mr. SIKES. You are asking for $74,409,000. How much did you request originally before any scaling down was done?

General REEDER. The total of this was $438 million.

Mr. SIKES. That was scaled down to $74 million?

General REEDER. Yes, sir.

Mr. SIKES. How much did you get last year for the same items that are covered in this budget?

General NOLD. I think I have a figure here of $222 million on procurement and production.

Mr. SIKES. Did that $222 million cover the same items plus additional items?

General NOLD. That is right, sir, and minus some of the items. There are a couple of these items that are new.

Mr. SIKES. How much money is left over from the 1952 appropriation at this time?

General NOLD. As of January 31 about $150 million on this particular budget out of the $222 million.

Mr. SIKES. How long will delivery continue on the items which are being purchased from 1952 funds and in what year will delivery be completed?

General REEDER. I think it will all be used in 1953. However, with a few exceptions, we do not consider that there is a necessity for maintaining a production line of these types of items. There is for some of these things which are listed here—a plastic assault boat, because there is no counterpart of that in civilian life. But as far as maintaining a production line with Caterpillar or Allis-Chalmers, no, because we are merely another customer that buys a bulldozer.

NONCOMBAT VEHICLES FOR ENGINEERS

Mr. SIKES. Let us take a look at project 1210, noncombat vehicles, the total for which is $4,597,000. Is any of that special order equipment or is all of it standard equipment of a type provided for the commercial trade?

General NOLD. The bolster body is special. That is the item at the bottom of the page. That takes an ordnance chassis and certain modifications are made in order to carry bridging equipment. But the trailers are standard and the fire, pumper——

Mr. SIKES. Your last item, truck, bolster body, is your largest item, $2,700,000. Can you not find a commercial truck that is heavy enough and strong enough to do that job?

General REEDER. It has to be an all-wheel drive. It is a tactical truck with all the axles driving.

General NOLD. We modify the body to take care of the special bridging.

Mr. SIKES. As for the noncombat vehicles, are you using all of them now; none represents something new which is being put into use this year?

General NOLD. No, sir.

Mr. SIKES. Are you building up your war reserve on any of these items?

General NOLD. Yes, sir; a modest amount.

Mr. SIKES. On all of them? Will you go through this list and tell me what your war reserve is and what you are building up to on each of these items?

Colonel EISIMINGER. Mr. Chairman, we do not have a percentage worked out here, but we have all the figures here.

(Discussion off the record.)

Mr. SIKES. Since those items are commercial items, why is it necessary to buy them and put them into the reserve? Why not buy them when you need them?

General REEDER. As a matter of policy, sir, we want some things as part of the reserve even though they are commercial items. We expect—and here I would like to go off the record for a moment, if I may?

Mr. SIKES. Very well.

(Off the record.)

Mr. SIKES. Do these figures complete your 3-months' reserve?

General REEDER. These were worked out to try to have them in step with the stuff that they are going to lug around. For example, these low-bed trailers are to load earth-moving equipment, shovels and bulldozers, move them from job to job.

Mr. SIKES. I believe Colonel Eisiminger has some figures here. Does this complete your 3-months' reserve?

Colonel EISIMINGER. I have it consolidated here, but I would like to give these figures off the record, if I may.

(Off the record.)

Mr. SIKES. Apparently it comes to about 10 percent of these items?

General NOLD. That is on the first item.

CONCURRENT SPARE PARTS FOR VEHICLES

Mr. SIKES. I notice you are buying concurrent spares. Since these are commercial vehicles of standard construction, why is it necessary to buy spare parts?

General NOLD. Spare parts is one of the very difficult items in our keeping going. The first equipment that went over to Korea was to have had spare parts, but those were procured separately and some of those spare parts were not caught up with for nearly a year. We have given great attention to that since that time. My own experience in the field is that spare parts are one of the most essential categories of items. You have to use judgment on what to get with concurrent spare parts.

Mr. SIKES. How do you handle your spare-parts problem? Do the parts go with the unit?

General NOLD. Yes, sir; right with the unit.

Mr. SIKES. How are you sure that the parts are keeping up with the truck?

General REEDER. They do not all go with the unit; that is, concurrent spare parts get spread through the system. Some of them go with the unit.

General NOLD. That is right; the most essential ones.

Mr. SIKES. I can certainly understand what you are talking about there, because I have seen many instances where equipment has been made useless simply because spare parts were not available.

General NOLD. That is correct. They have to cannibalize to too great an extent sometimes.

General DECKER. I have some figures that I think would be helpful to the committee that I would like to give off the record, since they deal with the war reserve.

Mr. SIKES. Very well.

(Off the record.)

WAR RESERVE PROBLEM

Mr. SIKES. All of us recognize what our problem is. We are trying to build a war reserve so that when and if Joe Stalin pulls the trigger, we will have something on hand to fight with. Russia is going to have their war reserve, because Stalin knows when he is going to pull the trigger. That is the difficulty that we are up against. We do not know when he is going to pull the trigger and we are trying to build up a little war reserve in order that we may not be caught flatfooted, if war should come at any given moment.

Then there is always the feeling that the more nearly we are prepared with a war reserve, to enable us to wage effective warfare for a number of months, the less likelihood there is of that trigger being pulled. But on the other hand there is the expense of a war reserve. In a democracy we have to worry about expenses.

With reference to that last item, the 2½-ton six-by-six truck, bolster body, is any of that for war reserve?

Colonel EISIMINGER. Yes, sir.

(Discussion off the record.)

Mr. SIKES. That would be the beginning of the war reserve?

Colonel EISIMINGER. Yes, sir.

(Discussion off the record.)

Mr. SIKES. I am still not satisfied with the answer that you gave me concerning the necessity of having a war reserve of items that are in every-day commercial production.

(Off the record.)

BASIS OF COMPUTATION OF REQUIREMENTS FOR COMMERCIAL-TYPE EQUIPMENT

General NOLD. Mr. Chairman, we made some rather elaborate figures, with the aid of industry, 2 years ago, which we are trying to keep up to date once a year, again with their aid, on the construction equipment that is in common use, which is needed both by troops and by the construction industry in the great programs which you always have in the rear lines and the Zone of Interior, and so forth.

That includes such items as compressors, which you will see here a little later on, bulldozers, shovels of the more common types. We spent several months in getting that data and we think it quite useful.

Our endeavor was to determine what our construction capacity could be in the advent of a war by making use of certain data; that is, after certain things have been accomplished. Now those have been accomplished. Since then we have had the build-up for Korea, and so forth.

We have also used that same data to analyze what might be available in a sudden emergency to equip troops on top of that load. The construction load comes along first. I do not have those figures before me, but they are rather elaborate.

But it is from that commercial data that we can determine to a degree whether we can expect to buy items promptly. So we do have some basic data on which judgment may be exercised, on commercial-type equipment.

Mr. SCRIVNER. Is that study based upon the experience that you encountered in World War II?

General NOLD. Yes.

Mr. SCRIVNER. Did you not modify it somewhat for the present program?

General NOLD. Yes, sir.

Mr. SCRIVNER. Because, in the case of World War II, many of those plants had to be built from scratch, and some of those plants are now in stand-by condition. Many of them have been in our program of expediting production.

General NOLD. That is right.

Mr. SCRIVNER. Many of them have already been restored. How much did you modify that?

General NOLD. I cannot answer that offhand, but we used that factor and in addition we used another factor. At the time of World War II, you may remember that the construction industry was in a completely different situation. The warehouses were full of equipment, and the Government became the principal equipment owner. At the start of Korea the reverse was true. Most of the equipment was in the hands of the construction industry.

Mr. SCRIVNER. Yes, but I have not seen any inventory—I do not know whether you have one or not—of all the types of equipment that we had at the end of World War II. There must have been an enormous number of items, many of which have a very long life.

General REEDER. They were disposed of.

General NOLD. Our analysis included all of the construction equipment of the country.

Mr. SCRIVNER. What happened to that?

General REEDER. Most of that was disposed of.

Mr. SCRIVNER. Where was it disposed of and what happened to it? A great many of those items must still be in the hands of the construction industry.

General NOLD. Our figures show that, Mr. Scrivner, and different lives were applied, based on construction experience to the different classes of equipment. A bulldozer, let us say, has a 4-year life; a shovel of a certain type might have an 8-year life, and the inventory country-wide on those selected items took all of that into account, as to where it was and as to what the production capacity was.

ELECTRONICS AND COMMUNICATIONS REQUIREMENTS FOR ENGINEERS

Mr. SIKES. Let us take a look at project 1310, on page 125 of the justifications, "Electronics and communications requirements," for which you are asking $4,053,000. How much money did you require for the same project in 1952?

General REEDER. $4,791,582.

Mr. SIKES. And was that applied to substantially the same items, or were they different items?

(Discussion off the record.)

Colonel EISIMINGER. They had the sniperscope last year and this year there are none.

Mr. SIKES. Is this for field use or war reserve?

Colonel EISIMINGER. I think we have a different purpose for each one of those.

(Discussion off the record.)

Mr. SIKES. When will they be delivered?

Colonel EISIMINGER. They are being produced right now, but the delivery schedule escapes me. While that is being looked up, referring to the last item on that list, there is another detector. Those two mine detectors have been in the stage of development and production at the same time.

Mr. SIKES. Have they been used in the field?

Colonel EISIMINGER. They have a different type, another mine detector. The top one, which is the metallic mine detector, they have used in the field for field service tests. They are coming out of the original contract which was from 1951 funds.

Mr. SIKES. Does this represent new development?

Colonel EISIMINGER. Yes, sir. The bottom item, the PRS–4, the nonmetallic one, deliveries on that have been slower.

(Discussion off the record.)

Mr. SIKES. Do you have figures on the PRS–4?

Colonel EISIMINGER. I do not have figures on those.

(Off the record.)

General REEDER. Both of the quantities here of 2,800 and 1,600 were chosen merely to keep the production lines going through the reorder lead time into 1954, until the 1954 appropriation could pick up the procurement.

Mr. SCRIVNER. Have any of the PRS–3's been used in Korea?

Colonel EISIMINGER. They have only been service-tested in Korea.

(Discussion off the record.)

Mr. SIKES. What about the monocular? Tell us how you estimated your requirements and what service they are actually rendering.

(Discussion off the record.)

OTHER MAJOR PROCUREMENT, CORPS OF ENGINEERS

Mr. SIKES. Let us take project 1510, "Other major procurement," for which you are asking $65,659,000. What was your request originally for this project 1510?

General REEDER. The original request was $438 million.

Mr. SIKES. What type of items were eliminated?

General REEDER. Commercial items or those very closely commercial.

Mr. SIKES. What kind of commercial items?

Geenral REEDER. Earth-moving equipment, both cranes and bulldozers, air compressors, drills, jackhammers.

Mr. SIKES. As I understood your statement, General Nold, a considerable part of the $65 million is in support of the guided-missiles program?

General NOLD. In point of cash; yes, sir.

Mr. SIKES. Roughly, how much of the $65 million requirement is in commercial production at this time?

General NOLD. We can go right down the line beginning with the air-conditioning unit, the first item. That is substantially commercial.

General REEDER. It differs, however, in the fact that you have to have it trailer-mounted.

General NOLD. That is right. We have to make some modifications, but it is substantially comercial.

Mr. SIKES. Go ahead, please?

General NOLD. The compressor, 500 cubic feet per minute—that is substantially a commercial item.

The generator set, 30 kilowatts is substantially a commercial item.

General REEDER. With 400 cycles?

General NOLD. Well, I do not know.

General REEDER. There is no 400-cycle made commercially. Sixty-cycle, yes; but not 400.

General NOLD. I think that is right. This is special.

Mr. SCRIVNER. Why can you not use the 60?

General REEDER. This is for use with communications.

General NOLD. That is right.

Colonel EISIMINGER. This is the control of the skysweeper.

General NOLD. It is an antiaircraft-artillery requirement.

Colonel EISIMINGER. It is the generator for the control.

General REEDER. All of the communication people have gone to the 400-cycle because it gives a smaller job for the same power output of current and gives a much smoother voltage characteristic.

General NOLD. The last item, the sump pump. 175 gallons per minute, is substantially a commercial item except that we put it up in a package unit. It has other elements in with it.

Mr. SIKES. Is it necessary that the remainder have to be made on special order?

General NOLD. Yes, sir. The prefabricated building might be considered a commercial item, since it is in production, except that the type desired is not in substantial production. The design is there; the prototype is there; but, generally speaking, the manufacturers are not yet set up to build it.

(Discussion off the record.)

NEED FOR PLASTIC BOAT

Mr. SIKES. $545 is a rather high price to pay for an 18-foot boat. How much would the same boat cost in metal or wood?

Mr. KALLIO. We have a picture here of the plastic boat. The alternative to that would be the present plywood boat which we have, and which is not holding up too well. There is a large amount of maintenance on it. Another alternative would be to have an aluminum boat. Of course, aluminum has been a little hard for us to get for this type of item. So, they have developed this plastic boat.

Mr. SIKES. Why is it necessary that it be plastic or aluminum or plywood?

General REEDER. It has to be very light for assault troops to carry and put into the river and cross.

Mr. SIKES. How many troops are going to carry this boat?

General REEDER. All of them, when they make an attack across a river, before you build a bridge.

Mr. SIKES. How many men would there be to the boat? What would be the capacity?

Colonel EISIMINGER. You can get 11 men in the boat.

Mr. SIKES. Eleven men can carry a boat made out of other types of lumber than plywood.

General REEDER. That is true, but they cannot carry their rifles and packs and ammunition and take on very much more.

General NOLD. You need a light boat.

Mr. SCRIVNER. What rivers are you going to cross with this boat?

General NOLD. Wherever we have combat, we have rivers. Assault boats are used before you get your bridge across.

Mr. SIKES. Do you know what the comparative weights are of plastic, aluminum, plywood, cypress, and cedar?

General NOLD. We would have to develop those figures.

Mr. SIKES. Will you provide that information for me, as well as the comparative cost of each?

General NOLD. Yes, sir.

Mr. SIKES. What I want is the comparative cost of a plywood boat, an aluminum boat, a plastic boat, and some other commonly used metal and some other commonly used wood that is in general supply; as well as the comparative weight.

General NOLD. Yes, sir.

(The information requested is as follows:)

Comparative costs and weights for: Plastic boat, plywood boat, aluminum boat, and other commonly used metals or woods (cypress, cedar) in common supply.

Comment and available estimates are supplied as follows:

The boat in question is still in the developmental and test stage and present indications are that revisions in its design will be made prior to actual procurement in fiscal year 1953.

Since the boat, as presently designed, has not been fabricated on a production basis in any material, accurate cost figures are not available. On the basis of experimental pilot model procurement in plastic and aluminum of the designs now being tested and of experience in past procurement of other boats and pontons having similar characteristics, it is estimated that costs and weights of the 18-foot assault boat, as presently designed, would be about as follows:

	Estimated cost (in production)	Approximate weight (pounds)
Plastic design (reinforced with aluminum to provide required strength characteristics)	[1] $750	540
Aluminum design	1,200	440
Plywood (no existing design)	600	700

[1] The cost of $545 shown in the budget estimate was based on the original design which was later modified to include additional reinforcing.

No serious consideration is now given to fabrication of the boat, in its present design, in other metals or in wood (other than plywood). Magnesium has been considered but rejected because of cost and lack of adaptability to the requirement. Steel would be too heavy, wood (cypress, cedar, etc.) would be heavy, vulnerable to damage due to rough handling and overland transport and costly to maintain and repair.

It should be pointed out that the 18-foot assault boat under discussion is designed for dual use not only as an assault boat but also as the ponton or floating element of the light tactical bridge. In the latter application, it has to have much greater strength and ruggedness built into it than is required in the straight assault boat application.

Engineering and service tests to date indicate that it will probably not be technically or economically feasible to standardize on the dual purpose design. The present design is too heavy and larger than necessary for the straight assault boat application; a lighter and smaller boat would not fulfill the bridge ponton requirements. We are now redesigning on the basis of two boats, one for straight assault boat uses which will be lighter in weight and less expensive in production; the other will be comparable to, though probably slightly higher in weight, than the present design. Since basic design work in this connection is largely done there should be no difficulty in putting both revised designs into production during fiscal year 1953.

While no firm figures on costs of the proposed smaller assault boat are available, cost reductions, below estimates for the present design, should be proportional to the weight reduction (to 300 pounds or less for any material is desired) except in the case of the plastic boat. It is anticipated that elimination of a major part of the aluminum reinforcing, essential in the ponton, will simplify production and result in a unit cost comparable to that for plywood construction.

Consideration is being given to providing an alternate design of the smaller boat in wood (cypress, cedar, etc.). A primary design in plastic, with an alternate in plywood now seems probable. Weight and costs for the lighter boat should be on the order of 300 pounds weight and $250 and $350 in cost.

COMPUTATION PROCEDURE FOR ENGINEER PROCUREMENT ITEMS

Mr. SIKES. Have all of these figures been carefully considered and scaled down, General Nold, as low as they can safely be scaled down?

General NOLD. I think so. I think a little recitation of that might be useful to your purpose.

Mr. SIKES. All right.

Colonel EISIMINGER. The unit cost itself is made up from the bare procurement cost that we have gotten from the lowest contracts we have bought in the last year or two. If we have not bought that item in the last couple of years, we have gone out to industry to find out what the rough cost would be. To that we have added our estimated transportation of the spare parts. Spare parts are different for every item because of the different types. We have gone through the 519 (B) computation, as I am sure General Reeder has explained to you.

There was one thing where we took credit for an item we did not have time to recompute on all of our forms; so we just reduced it to the budget quantity. We are down to a point now where we feel we are at the minimum item by item. But, as you realize, in building a budget and due to the other things happening at the same time, maybe one item will have a few too many and another one not enough; so when we come around to the procurement we might buy 38 of the first item or might buy 40, or we might buy 35. But we have done the best we could do with every item we have put in the budget.

PREFABRICATED BUILDINGS

Mr. SIKES. Some questions have been raised about the purchase of prefabricated buildings. You are asking for a total of 111,000 of those at a cost of $2,168 in over-all requirements.

General REEDER. No, sir.

(Off the record.)

General NOLD. Even so, it is a substantial item in cost.

Colonel EISIMINGER. The cost is quite large, even at that; and we have had to go to the extreme minimum. [Off the record.] General Reeder personally has cut down the quantities requested.

(Off the record.)

General REEDER. Actually, I cut off Korea and refused to do anything about it at the present time.

Mr. SIKES. Is this item all for use, or is it in part for war reserve?

(Discussion off the record.)

Mr. SIKES. Have those that have been bought in fiscal 1951 and 1952 been delivered, or a substantial part of them delivered?

General NOLD. That is correct.

(Off the record.)

General REEDER. There is a joker to this. The Navy had considerable stocks, and we have been getting their stocks; they go out and replace them. They have run out of those stocks now.

Mr. SIKES. What is the life of one of these buildings?

General NOLD. It varies. It depends, of course, on the theater in which you are. We have usually treated them as having about a 5-year life.

Mr. SIKES. Out of what are they made?

General NOLD. It is the Quonset hut except those we have been buying as rapidly as better designs have been developed, which are straight-sided buildings. They have a little better capacity for a variety of purposes.

Mr. SIKES. Some complaints have reached the committee about procurement policy and methods on prefabs. I would like your comments on this. The statement is made that no fixed policy is observed in evaluating bids; that procurement officers have too much latitude on what will be bought; that the method of handling freight is not specified in the bid, so that freight can be charged in or out of the final award, which results in different treatment between contractors.

What is your comment on that?

General NOLD. I cannot answer that exactly; because, as you know, the Navy is the procurement agent on this. When it comes, however, to the specifications, we set the specifications. In the last procurement that came to my attention we had three different types under which bids were invited. Any one of those that was competitive would be acceptable.

Mr. SIKES. I would like a statement to be submitted to the committee showing what latitude, if any, procurement officers do have for the different services or for the requirements of one service and whether or not freight charges can be placed in a contract or left out of the contract at the discretion of the contracting officer.

The statement has been made that there is a contradiction between the stated urgency and methods, by giving contracts to contractors who cannot possibly deliver on time, which does not make urgent items available when needed, and possibly on unnecessarily short-time bids, which increases the cost of the bids.

There is the further complaint that specifications vary, new prototypes are developed, and that further makes delivery difficult.

(The information requested may be found at p. 982.)

Have you any information on that?

General NOLD. I can say this: We have been endeavoring since the war to develop—all of the services have been endeavoring to develop—the ideal mobile or transportable shelter. I do not know that we will ever get the ideal one. We have had many experiments with the frame type or wooden type and had those under test and change and so forth for a number of years.

One of the problems in respect to timber where you cannot manufacture at the local source is the shipping weight. We have endeavored by ingenuity to cut down the packaging, to cut down the bulk, but the weight is always there. A steel building is lighter than a wooden one.

Steel, however, on occasion comes in short supply. That is not so with the type of shelter we are buying here. Those items which are governed pretty largely by the capacity of the rolling mills are not in short supply.

That has to be evaluated almost every 3 months, I would say, in order to know what you are doing.

The manufacturers are ingenious, also. They come up with new ideas and different designs, and where we find a type that is designed for the public that the manufacturer is able to produce for us, or we find is worthy of buying one unit for test, we go through that.

The Navy is testing two different types for us at the present time, and we have others that we are continuing experiments on.

I do not think your prototypes will remain stable over a period of 2 or 3 years, based on shortages or apparent cheapness of the product, shipping weight, and other conditions. I think they will vary from time to time.

I think we should have several different types that will meet the requirements under different conditions, and that we have been endeavoring to do and I think with some success. There are at least 100 different types of buildings that some manufacturer is willing to state is plenty good enough.

Mr. SIKES. Who determines whether a contractor can deliver the item when he is awarded a bid?

General NOLD. The interested agency—that is, ourselves for those we are asking to be procured—takes a reading on that situation in order to protect itself. The responsibility primarily is on the procurement agent, which is the Navy.

Mr. SIKES. What is your comment on the statement that impossible or unnecessarily short terms—meaning the length of time in which the contract is completed—increase the cost of bids and do not accomplish delivery of the buildings?

Generald NOLD. In almost all of these procurements we have had up to the present time, we have been behind the delivery date asked by the using service, which in this case was Korea.

General REEDER. I might say on these prefabricated buildings we anticipate a continuing demand if an uneasy armistice is arrived at. There will be the necessity for keeping troops there for some time, and there will be simultaneouly a demand to keep them there in greater comfort than now. In other words, they will be rotated back to places for greater comfort than the peninsula can now afford, and then they will be sent back in the line.

General NOLD. And to protect certain classes of supplies that we simply cannot protect now.

Mr. SIKES. Let me get your comment on this. In October 1951, the Army engineers at St. Louis issued an invitation to bid on 2,000 Arctic huts, based on its own design. The invitation specified bids were due on November 5, 1951, provided for 15 days for review before award, and required complete delivery by December 31, 1951. In view of the size of the order and the fact that new tooling would be required and the short time, fulfillment of this contract was alleged to be impossible. Nevertheless, one company bid on the basis of delivering 1,000 by December 31 and asked for a three-shift, 7-day week with resulting high cost. The low bidder was a contractor under Federal

indictment and in bankruptcy. The second low was a firm with a New York address which could not be located. The third low was a small company in Massachusetts. All bids were rejected because the lowest was $3,800, and the project was abandoned.

Why issue unrealistic invitations, inviting high-cost bids?

Do the procurement people concern themselves as to whether a contractor can perform, or are they only concerned with issuing a contract so as to get out from under pressure? Why should not bid bonds or other devices be used to eliminate racketeer or irresponsible bidders?

General NOLD. I do not think I could answer that offhand.

General REEDER. You will have to go to the Navy on that.

General NOLD. This says the Army engineers.

Mr. SIKES. This says the Army engineers issued an invitation to bid on 2,000 arctic huts based on its own design. I recognize you might not be able, General, to answer now, but I want a specific answer on it when you are able to assemble the information.

In the meantime, I think you should comment on the very unrealistic policy of asking for bids on November 5 for delivery by December 31—obviously an impossible situation.

General NOLD. On special design, if it is a special design, if all of those are facts as stated in that letter, it will be hard to answer. May we have a copy of that so that we can answer in detail?

Mr. SIKES. It is in the record, and you will have the record tomorrow, or we can provide a copy if you need it.

General NOLD. I think this report will be sufficient.

Mr. SIKES. Give me a complete statement on that.

General NOLD. Yes, sir.

(The information requested is as follows:)

With reference to the unrealistic invitation inquiry, this was based on a requirement from the theater commander that this delivery time (December 31, 1951) was essential. Bids were taken on the basis of the required delivery and bidders were also requested to indicate reduction in price for later delivery. Even with additional 3 months time for delivery, the lowest responsive bid was still 180 percent (approximately) of the cost of an arch-rib, steel, building of comparable size. The rejection of bids was not, therefore, based on high costs due to quick delivery, but on the greater cost of this design, regardless of delivery requirements.

Bid and performance bonds are used when the contracting officer, from his experience, considers it in the best interest of the Government. Indiscriminate use of such bonds would unduly penalize small-business concerns, as costs of bonds and difficulty of arranging loans after bonds have been obtained, are matters of critical importance to the small-business bidder.

The distinction between irresponsible bidders and irresponsible contractors should be made. The contracting officer, purchasing items which can be manufactured by numerous concerns, cannot deny the right to bid to anyone conducting a legitimate business. He can, and does, however, carefully check the ability of the low bidder to perform, before the contract is awarded. When preaward surveys, conducted by established field offices, indicate that a low bidder cannot perform, the bid is rejected.

Mr. SIKES. Why have there not been efforts for unified buying so that all of the services use the same specifications? Your requirements are substantially similar or are similar enough so that one good specification should do for all of these prefabricated buildings, I should think.

General NOLD. I think so; but there are different uses, of course, for prefabricated buildings.

Mr. SIKES. You might require several general types, but not a full set of types for each service.

Has any effort been made to eliminate unnecessary specifications?

General NOLD. We have been working with the Navy toward getting a uniform design that would be acceptable to both services.

Mr. SCRIVNER. How far have you gotten?

General NOLD. We have some time to go. The Army's requirements are vastly greater than the Navy's requirements in variety, such as in the one we are going through here now. The Navy's requirements are primarily in connection with base installations that serve them for their shore activities in connection with fleet operations.

USE OF BID BONDS

Mr. SIKES. Is any effort made to require bid bonds or qualification as to past experience or information on the contractor's financial status before bids are accepted?

General REEDER. I can answer that generally, yes. The contracting officer is responsible for selecting a responsible bidder, and he may reject any bid which is not a bid by a responsible bidder.

Mr. SIKES. How does he determine whether it is a responsible bidder if he does not require a bid bond or some qualification of past experience or past record?

General REEDER. He does a number of things. He looks to see whether the man has a plant and whether he has done this kind of business before.

Mr. SIKES. I just gave you an illustration here where the low bidder was in bankruptcy.

General REEDER. He did not get the bid. No contract was awarded.

Mr. SIKES. No contract was awarded; nevertheless these people were allowed to bid.

General REEDER. There is nothing to prevent a man from bidding.

General NOLD. We have had people in jail who submitted bids in past years, but they did not necessarily get the award.

General REEDER. May I say that is one of our problems. We have repeatedly in the small-business field tried to decide whether we will, in the interest of small business, take a bid from a man who is a pretty doubtful risk as a responsible bidder in comparison with a much more responsible bidder who is classified as big business; we have had quite a few burns as a result. And we have even had some cases of good people making irresponsible bids.

In June of 1950, for some reason or other, part of the electronics industry decided they could make some stuff cheaply, and they ended up badly. We have had them on our hands for relief now under the War Powers Act to modify their contracts and so forth.

Again, the quartz-crystal industry as a whole underbid on furnishing crystals. The change in the crystal technology since the war threw them off the line, and they all underbid. We are going to have a great many cases under this labor-surplus-buying procedure, by which any firm in a labor-surplus area can match the low bid.

Mr. SCRIVNER. When you do that, are you going to include freight in your bids so as to see whether you are really getting the low bid or not?

General REEDER. That is one more case, and we have quite a lot of pressure to accept merchandise at places where we do not necessarily want it.

(Off the record.)

Mr. SCRIVNER. Of course, this committee is concerned with getting the best we can for the least amount of dollars.

General NOLD. In respect to housing, we might go back to last year's bids. I mentioned the fact that three specifications were advertised as being acceptable in an endeavor to get the best price we could. Even so, we had bids that were not completely responsive to the specifications. The capacity of manufacturers, their reliability, previous experience in manufacture were analyzed. One of those who participated had never actually manufactured a unit, and it was questionable whether he could set up assembly lines to meet the reasonable procurement date. So those things are analyzed.

INCLUSION OF TRANSPORTATION COSTS IN BIDS

Mr. SCRIVNER. This discussion has brought up one of the unsatisfactory situations in which we have been placed in other fields, namely, that in some contracts transportation is included to the first point of delivery while others do not include that, and the Technical Service comes in then and asks for a certain amount for transportation. Apparently that has been happening in this field of prefabricated housing. Apparently some of the contracts call for the price f. o. b. plant; others call for the price at some scheduled delivery point. It would seem to me that logic would dictate that the contracts be the same throughout; otherwise there is no basis upon which we can determine the comparative cost; and it makes it difficult for the manufacturers as well to make some of their bids.

General NOLD. We will give you the answer to that, Mr. Scrivner.

(The information requested is as follows:)

Army Procurement Procedure 1–350 "f. o. b. purchasing policy" states, in part: "Unless there are valid reasons to the contrary (such as, but not restricted to, industry practice, or destination unknown) all supply contracts shall provide for delivery as follows:

"a. * * *

"b. When it is estimated that any single contract will require a shipment of minimum carload lot, delivery, and acceptance may be either on the basis of f. o. b. plant or on the basis of all transportation charges paid to destination (within continental United States), whichever is more advantageous to the Government."

1–350.1 *Formal advertising*

"In furtherance of this policy in the case of formal advertising, bids for supplies will be invited as follows:

"a. * * *

"b. When it is estimated that a single contract (to be awarded) will provide for a shipment to a single destination of a carload lot or more, bids shall be invited as follows: Bid A—All transportation charges paid to destination (within the continental United States), and, Bid B—f. o. b. carrier's equipment, wharf or freight station at a specified city or shipping point.

"The invitation to bid will provide that bidders may bid on either of both bases A and B."

1–350.2 *Evaluation of bids and proposals*

"a. Bids and proposals will be evaluated on the basis of over-all cost to the Government. In connection with bids or proposals submitted on an f. o. b. origin basis, transportation costs between the source of supply and the designated destination point or points will be considered in determining the lowest estimated cost to the Government."

Under the above procedures, contracts are written with the f. o. b. point most advantageous to the Government. A careful determination is made, prior to an award, of the bid reflecting the lowest cost. The contract merely reflects that bid, citing the f. o. b. point involved. Comparative costs at the plant can be determined by deducting freight charges.

It is understood that the Transportation Corps, Department of the Army, has determined that this procedure saves substantial sums in transportation charges. It encourages short hauls, maximum benefits from special freight rates, utilization of lowest freight classification, and allows the Government the option of utilizing special agreements made by the Government and carriers under Interstate Commerce Commission regulations.

STANDARDIZATION OF PROCUREMENT INSPECTING

Mr. SCRIVNER. Let us go one step further. Apparently there is not as yet any uniformity or any standard of test between the Army and Navy. I am confining my remarks now to these prefabricated buildings. The Army is conducting a test at Balboa, I think; the Navy is conducting a test some place else. And what apparently will satisfy the Navy is not acceptable to the Army and vice versa, so that we have two things to be considered. First, we have the dual expense in the test and, second, we have no uniformity in their requirements that result.

Now, I can see where a certain type of building that might be required by the Navy, as you pointed out, at advance bases and things like that would not necessarily be the type of building that the Army might want for some other purpose, but there certainly must be a very large field in which a building that would pass a test suitable to the Navy certainly should be acceptable to the Army.

General NOLD. You understand, I am sure, Mr. Scrivner, that we do not duplicate in the Army the tests that are conducted by the Navy. That means they transmit their results to us. We, in turn, I will say, have different types under test, seeking a better answer to what we need, and we transmit the information to the Navy. They do not duplicate it.

Mr. SCRIVNER. I would feel much better if I could accept that just as you state it, but that is not exactly the way the picture has been presented to us, because in some instances the tests have been almost identical.

General NOLD. On houses?

Mr. SCRIVNER. On houses and other types of buildings; yes. That is the thing that is hard for the public to understand, hard for the contractor to understand, and hard for the committee to understand. As yet we have not—at least, I have not—had time to go fully into all of the details of those things. I wish we did, and perhaps later in the year, when we have a little more time, we may be able to run this thing down to the final degree. But as the report comes to the committee now, that is not a true picture all the way through. Tests are being made, and in some instances the requirements are not materially different; in other words, there is not a big difference. It is not big enough apparently to warrant both tests and both types of buildings.

Now, where there is a great difference in the need or requirement, we can understand that; but where they are closely similar, by getting the same or nearly the same type of building, I am quite sure you would be able to get better bids.

General NOLD. I will make a little report in connection with this review of that subject.

(The information referred to is as follows:)

There is continuing liaison and coordination between the Bureau of Yards and Docks, Navy, and the Corps of Engineers, Army, on prefabricated buildings. In instances where the Navy has developed a building that is suitable for a specific use by the Army, it is used by the Army. For example, during this fiscal year the Army has procured, through the Navy, thousands of arched-rib buildings. In instances where both organizations have requirements for a building of similar design, every effort is made, through coordination, to avoid direct duplication of testing, and it is felt that these efforts have been very effective in eliminating such duplication.

USE AND DESIGN OF PREFABRICATED BUILDINGS

Mr. SCRIVNER. While we are on this subject, in this one particular item just exactly what is this 20 by 48 building? For what is it to be used and where?

General NOLD. We have a picture of one of them here.

Mr. SCRIVNER. Is it a building that requires a high degree of skill to set up?

General NOLD. No, sir.

Mr. SCRIVNER. Can it be set up by unskilled labor?

General NOLD. Unskilled labor can set it up.

Mr. SCRIVNER. Or by troops in the field?

General NOLD. It is the troops that do erect these. And they are packaged units which must be transported without too much danger of extraordinary damage.

General REEDER. That picture is the type you did not buy.

General NOLD. That is one of the three types.

General REEDER. Is not this the type you did not buy?

Colonel EISIMINGER. I do not know the exact type we bought or did not buy, but this was close to the one we did buy. There is such a small difference between some of those——

General REEDER. Whose make is this?

Colonel EISIMINGER. It does not have the brand name on it.

General NOLD. Southern States was one, Armco was another, and I have forgotten the other.

Mr. SCRIVNER. I am interested in noting on this type you handed us of the interior view and exterior view that you are coming to the modular building program.

General NOLD. This is a modular affair. No doubt about that.

Mr. SCRIVNER. I am personally glad to see that, because maybe 5 or 6 years ago I raised that very question with the Engineers as to why they did not go into it, because I think it is a common-sense, practical thing.

General NOLD. It applies also to some of the commercial builders.

Mr. SCRIVNER. Surely. The commercial builders when they started out could have effected considerable savings by going to that, and I am glad to see it is done here, because that is probably one of the reasons why they can bring the price down, where you do not have as much waste, do not have to do as much special cutting, fitting, and so forth.

Now, for what will this building be used primarily?

Colonel EISIMINGER. I would like to go back a little bit and come up to this.

Mr. SCRIVNER. All right.

Colonel EISIMINGER. This is 100 percent for war reserve. Those we have bought in this current year which were meant to be war reserve we shipped to Korea.

Mr. SCRIVNER. First tell me what they are used for.

Colonel EISIMINGER. The specific purpose?

Mr. SCRIVNER. Yes.

Colonel EISIMINGER. Administration buildings, small supply type buildings. This one, this particular type of building right here, is not too good for maintenance.

Mr. SCRIVNER. By "maintenance," you mean what?

Colonel EISIMINGER. Maintenance of vehicles, engineer equipment, or something like that. You need a small building where mechanics can work with their hands and fingers and can keep warm. Most of the engineer maintenance is done outside because the equipment is too large to bring in, but small things like carburetors and fuel pumps they work on on the inside.

General NOLD. They are also for other services, not just engineers.

Colonel EISIMINGER. And if you need heat, then this is the building used for hospital wards; but if you are in the Tropics, you cannot use this projected type. Those are the basic uses.

Mr. SCRIVNER. Are any of them used for housing?

Colonel EISIMINGER. For small housing.

General REEDER. There are some 3,000 up there in Hokkaido. It is used for virtually any purpose.

Mr. SCRIVNER. In other words, it is a multipurpose building?

Colonel EISIMINGER. Yes, sir.

General REEDER. In theater operations. That is why I expect in Korea we will have a very considerable demand for them as things settle down to any uneasy armistice. They will want to house their troops just as close to the actual line of contact as they possibly can, and of those we shipped over to Korea, possibly some intended for Korea, quite a lot went up to Hokkaido when the guard divisions had to go up there. When the place down there was not ready, they pushed a lot of those buildings in there.

Mr. SCRIVNER. My recollection is that the Hokkaido temperatures get rather severe.

General REEDER. Yes, sir.

General NOLD. Severe and lots of snow.

Mr. SCRIVNER. How have these worked out in the field; what has been the report? Have they worked out the way you thought they would?

General REEDER. Nobody has ever gotten one on this.

General NOLD. They welcome any sort of shelter. It has always been short. The vertical-sided building, such as you see there, is much preferred to the old Quonset type.

Mr. SCRIVNER. I think it would be more practicable.

General NOLD. The Quonset, of course, was already in production; production lines were available, and we took them.

Mr. SCRIVNER. What has been the report on simplicity; has that been lived up to as well as you thought; can it be as easily erected as you anticipated?

General NOLD. Yes, sir.

Colonel EISIMINGER. Was that question specifically for Korea?

Mr. SCRIVNER. As to any of these types of buildings you have been procuring. I do not care whether they are to go to Korea or any place. What bugs have you run into?

General NOLD. I cannot answer that specifically, but our research crew has considerable data on that, if you would like a little statement on that for the record.

Mr. SCRIVNER. Have there been sufficient difficulties that you anticipate some change in the specifications?

General NOLD. No; except for improvements. From time to time they are able to improve the framing, and we are able to improve the packaging from time to time. There are some rather interesting developments on that.

Mr. SCRIVNER. Now, getting to this specific item which you say will be for mobilization reserve, is this so difficult or is the number of facilities so lacking that it is necessary to go into your war reserve construction at this time?

General REEDER. Yes, sir; otherwise you would have more of this very tight procurement that you are complaining about, of trying to get delivery in 30 days, because demand comes immediately for some of this stuff; that is what we were faced with in Korea. We did not have any, and they wanted them.

Mr. SCRIVNER. And they wanted them day before yesterday.

General REEDER. That is right.

Mr. SIKES. Does that complete your presentation, General Nold?

General NOLD. I think there is one other page that has to do with the preparation of manuals for inspectors.

General REEDER. We will take that up all in one piece. That is all.

Mr. SIKES. Thank you very much. We are glad to have you present.

General NOLD. I am glad to be here, Mr. Chairman.

TRANSPORTATION CORPS PROCUREMENT AND PRODUCTION

Mr. SIKES. Colonel Glore, you are to present the requirements of supply and procurement for the Transportation Corps; is that correct?

Colonel GLORE. Yes, sir. And I might comment that General Heileman will be here later on two projects with a much larger volume of money than this.

Mr. SIKES. Will you proceed?

GENERAL STATEMENT ON TRANSPORTATION CORPS PROCUREMENT

Colonel GLORE. I would like to read an opening statement for the record.

A total of $139.2 million is required in the fiscal year 1953 for the purchase of floating, railway and service test equipment. This may be compared to a total of $149.1 million obligated in fiscal year 1951 and $233.5 million to be obligated in fiscal year 1952. This represents a decrease of $94.3 million from the amount to be obligated in fiscal year 1952.

The funds requested are distributed as follows: Floating equipment, $117,281,000; railway equipment, $10,549,000; service or user test equipment, $8,670,000; first destination transportation, $2,718,000; total, $139,218,000.

FLOATING EQUIPMENT

Of the $117,281,000 requested for the procurement of floating equipment, 80.7 percent or $94.6 million is for the purchase of LSU's and three new types of self-propelled barges.

The Army Transportation Corps has two serious areas of operational equipment deficiencies. One is a lack of proper balance of equipment to move cargo through inland waterway, estuary, and other shallow-draft areas which must be used when the use of existing port areas is denied our forces.

To meet this need 51 self-propelled barges are required as follows: self-propelled barges for dry cargo, 24, $34,720.440; self-propelled barges for liquid cargo, 23, $32,918,750; self-propelled barges for refrigerated cargo, 4, $7,093,380; total, $74,732,570.

The second defficiency is a lack of landing craft to support the movement and efficient handling of tanks and other heavy equipment over beaches in supply operations where operable ports are not available. To meet this need a total of 39 LSU's, at a cost of $19.9 million, is required for tank-carrying landing craft for the active Army and for a partial mobilization reserve.

Nineteen million seven hundred thousand dollars is provided for items for mobilization reserve. The items to be procured are generally those which require long lead time such as tugs, large barges, and floating cranes.

The remaining $3 million required is for replacement of floating equipment used to support operations in Korea, and for normal replacements.

RAILWAY EQUIPMENT

Of the $10.5 million requested for railway equipment, $8 million is required for increased activities at Army installations in the continental United States and $2.5 million is needed for an ambulance train, which is a Medical Corps requirement. This ambulance train is the only item of railway equipment for overseas use.

Mobilization reserve for railway equipment has not been included in this estimate since most Transportation Corps railway equipment is of the same general commercial type produced by manufacturers in the United States. Because of the current shortage of railway rolling stock in the United States, it is desirable to use existing manufacturing facilities and materials for expansion of commercial transportation facilities.

The ability of manufacturers to expand present productive capacities and to shift from commercial production to military production will be relied upon primarily to provide overseas support requirements in the event of an emergency.

SERVICE AND USER TEST

Eight and six-tenths million dollars will be required for the procurement of items of new design or commercial types for service and user tests. These items are products of the Transportation Corps research and development program.

Two and seven-tenths million dollars is required for first destination transportation for equipment to be delivered in fiscal year 1953 from this and prior years' procurement.

The request for $139.2 million is the minimum amount which will permit the Transportation Corps to accomplish its support mission of the Army. As has been previously stated, full reliance has been placed on the ability of commercial manufacturers to meet mobilization requirements in the event of a full-scale emergency.

MOBILIZATION RESERVE REQUIREMENTS FOR TRANSPORTATION CORPS

Mr. SIKES. This is $139,200,000 as compared to $149,100,000 in 1951 and $233,500,000 in 1952.

How much of this is for mobilization reserve?

Colonel GLORE. It varies from item to item, but I would say——

Mr. SIKES. Give me the broad picture. Floating equipment is $117,000,000. How much of that is for mobilization reserve?

Colonel GLORE. $19,700,000.

Mr. SIKES. Are these long-lead-time items?

Colonel GLORE. They are, sir.

Mr. SIKES. In what year would these items be delivered?

General REEDER. I am looking at the moment at this 65-foot steel tug. This shows there will not be complete delivery of those until the third quarter of fiscal 1954.

Mr. SIKES. Are items of this same type now on order?

General REEDER. Yes, sir; they are.

Mr. SIKES. When will delivery be completed of items of this same general type now on order?

General REEDER. I just happened to turn to this 100-foot steel tug, 1,200 horsepower. There are 64 of those now on order, and the delivery of them will be completed in the third quarter of fiscal 1954.

Mr. SIKES. Without reference to the items contained in this budget request for $117 million, what percentage, generally speaking, of your mobilization reserve will you have from prior year budgets?

General REEDER. We will have very little of that.

Mr. SIKES. Now, of the $10,549,000 for railway equipment, how much of that is for mobilization reserve?

Colonel GLORE. None of that is for mobilization reserve. We have a foreign service item——

HOSPITAL TRAIN

General REEDER. There is only one. That would be the hospital train.

(Discussion off the record.)

Mr. SIKES. Where is that train to be used? What is the requirement for it?

Colonel GLORE. The requirement, as I understand from the Surgeon General, if four platoons, 5 cars each, 20 cars for ambulance service.

(Discussion off the record.)

Mr. SIKES. What are you using now?

Colonel GLORE. I do not know. We are agents for the Surgeon General, and I understand also—and this is hearsay—they have a

concept of ambulance-type evacuation rather than hospital-train treatment.

Mr. SIKES. Will you provide for us very speedily a statement showing the necessity for this?

(The information requested is as follows:)

STATEMENT IN SUPPORT OF HOSPITAL TRAIN

Information is provided below on the requirements of the Army Medical Service for overseas-type ambulance trains for which 20 railroad cars are now included in the fiscal year 1953 estimates.

At the present time, there are two hospital train units on duty in Europe. These units are being equipped with converted European railway equipment. Two additional hospital train units will soon be activated. The 20 ambulance cars included in the fiscal year 1953 budget represent the minimum equipment with which these two units can be equipped.

The previous concept of a hospital train capable of operation over long distances is believed to be outmoded. Preliminary investigation on possible redesign of hospital cars used during World War II indicated trains of at least 20 cars which would be most expensive to construct and would not provided a justifiable patient capacity. Therefore, the Surgeon General has developed criteria for a new type overseas ambulance train. It is this new type ambulance train which is requested in the fiscal year 1953 estimate.

In view of the increased emphasis on air evacuation of casualties, the present concept is that smaller ambulance trains designed for short hauls are the answer for the requirement for such equipment. There is presently in a design stage an ambulance train which will consist of one personnel car, one kitchen and dining car, and three to four ward cars. Each of these ward cars will carry 30 litter patients, thereby providing a capacity of 90 to 120 patients for each train. This new train will be a multigage type which, by changing trucks on the cars, can be operated on several track gages, permitting a flexibility of operation on railroads throughout the world. The cars are being designed for construction on a most strict austerity basis. The only limiting factor in the austerity of the construction in these cars is the provision of comfortable and safe transportation for the sick and wounded.

The provision of the two hospital train units to be soon activated for the General Reserve with suitable railway equipment is considered critical. This point is emphasized by the fact that with the advent of the Korean incident a pressing requirement for rail evacuation equipment for sick and wounded became apparent. It can be considered most fortunate that hospital cars designed only for use in this country and held as a mobilization reserve could be operated on Korean railroads. These cars were sent to that country and have been used to the greatest advantage in the evacuation of sick and wounded. Particularly, in view of this fact, the equipping of two hospital train units in the General Reserve with ambulance cars designed for utilization on a world-wide basis is believed to be justified.

Mr. SCRIVNER. At the same time, the question arises in my mind of what happened to all of the ambulance trains we had overseas and in the zone of the interior at the end of World War II. They went into a special ambulance train building program, developed a new type of ambulance coach, and I can recall seeing them scattered on sidings almost across the Nation in every major railroad yard for a long time. I do not know what happened to them, but I know I saw them.

Mr. SIKES. Do you know, Colonel?

Colonel GLORE. I have a general knowledge. My general knowledge of it runs in the direction that many of those cars belonged to the Defense Plant Corporation and were put out and converted back to various types of service for railway use. I do know of my own knowledge that when the Korean war broke out we had just 100 hospital cars, 63 of which went to Korea in the possession of the Army, and those we are now replacing.

Mr. SIKES. Is there no one here who has additional information?

General REEDER. Yes. This thing is not a hospital train. They have hospital cars, but the medical conception is that we progress and as they fly patients from Korea back to Tripler, give them rest and then fly them back here to special treatment hospitals, they feel they can reduce death of casualties by evacuation rapidly in smaller groups on ambulance trains rather than the slower, bigger hospital trains in which they try to treat them en route. This is only one unit with which to try it out. It will be shipped to troops that exist and are presently in Europe. It is not the entire requirement; it would not support all of the campaigns or anything of that sort. It is merely an experiment to try out in peacetime what they think may be an advance in wartime.

Mr. SIKES. We will want additional information on just what did happen to those we had during the war. You told us what you thought, but I would like you to determine if that is the case and, if not, let us know what did happen to them.

Colonel GLORE. Yes, sir.

(The information requested is as follows:)

Hospital cars purchased by the Army Transportation Corps during World War II

Purchased second-hand	120
Purchased new	200
Total	320

DISPOSITION

(1) The 120 second-hand cars were later converted to mortuary cars. The other 200 cars have been reconverted to other types of cars, such as prisoner cars, baggage cars, repatriation program; 25 are presently in service; 34 are in storage, and 61 are now passenger cars for operational and training purposes.

(2) One hundred cars were sold as surplus in 1946 through the War Assets Administration.

(3) Sixty-three cars were shipped to Korea in 1951.

(4) Thirty-seven cars are now in operation in the continental United States.

REQUIREMENTS FOR POWERED LIGHTER CRAFT

Mr. SIKES. Now, on your LSU's, there is a case where we had a great many of somewhat similar craft during World War II. Does this represent a new type of equipment, different from anything we had during World War II?

Colonel GLORE. No, sir. We are adopting the Navy standard LSU with such improvements as they may have incorporated.

Mr. SIKES. Have all of those we had left from World War II been sold for surplus?

Colonel GLORE. I doubt it. I do know these represent requirements that the Navy is unable to supply us against our mission, and I believe this year they had considerable difficulty lending us 24 for this summer's operation.

General REEDER. This is not a long-life vessel.

Colonel GLORE. No, sir; this is not a long-life vessel. They have some on hand for their own use.

Mr. SIKES. What are the physical characteristics of the LSU's that are being bought in this budget?

Colonel GLORE. They weigh about 135 tons. They are powered lighter craft. They will haul the heaviest items of equipment or tanks that we have and put them over on the beaches, and with very small crews. They are the open-hull type which can be loaded from the ship's cargo gear offshore.

Mr. SIKES. What is the length, width, and draft?

Colonel GLORE. It is roughly 115 by about 24.

Mr. SIKES. And the draft?

Colonel GLORE. The draft is 5 feet 6 aft—7 feet at the most.

Mr. SIKES. Tell me something about the self-propelled barges and describe their cargo capacity, size, and draft.

Colonel GLORE. We have three types of those. They are built on a master hull, a master frame, with the idea of simplifying construction in greater numbers. They are classed as a 190-foot barge. They may come to 200 on the development model. They have a certain capacity for drying out on shallow beaches and sustaining themselves as long as the water in their tanks lasts, and they can dry out and support auxiliaries until the tide comes back. They are built in three ways—dry cargo, liquid petroleum, and refrigerated commodities.

Mr. SIKES. What is the draft?

Colonel GLORE. That is still problematical. Probably for 200 feet it would be in the vicinity of 13 to 14 feet—a shallow draft for that tonnage.

Mr. SIKES. Is there anything radically new about these barges, or are they substantially the same as barges that are now in use commercially?

Colonel GLORE. There is no commercial barge that will go aground and support its auxiliaries today in an awkward situation like that. If they are aground, they are in trouble.

General REEDER. This is actually a design you worked out since the war?

Colonel GLORE. That is right. Our first prototypes are coming out this fall from the 1951 procurement.

Mr. SIKES. Then these self-propelled barges are not used commercially?

Colonel GLORE. No, sir. Harbor lighters are not usually built for below decks cargo carrying.

Mr. SCRIVNER. My recollection is we were trying to get air-borne transportation under one head, and we were trying to get water-borne transportation under one head, but this looks as though the Army is going out on another water-borne transportation program.

ARMY AND NAVY WATER-TRANSPORTATION RESPONSIBILITIES

General REEDER. We have never been out of it. This is not water-borne; this is for port service only.

Mr. SCRIVNER. Maybe the picture given us was incomplete, then. I thought I understood what the purpose of the LSU's and barges was, but maybe I do not.

General REEDER. These are only for discharge. We are responsible for the discharge of cargo ships when they arrive in port.

Mr. SCRIVNER. Well, somebody had better go back. I am a landlubber from the Middle West, and there are quite a few million people in the same situation as I am, who find it hard to find any reason for

the Army procuring equipment like this when the Navy is going to do the most of it.

General REEDER. The Navy does not do it. It does not do it now and never has.

Mr. SCRIVNER. Wait a minute. Maybe it does not. That is just exactly what I am coming to; namely, that the average person understands when the procurement is developed that the Navy does the water-borne transportation. Now, where does the Navy's job start and where does the Navy's job end, and where does the Army's job start and where does the Army's job end?

General REEDER. At the end of ship's tackle.

Colonel GLORE. The Army's job ends at the end of ship's tackle in the hold in the zone of interior, and it begins at the end of ship's tackle on the far shore.

Mr. SCRIVNER. Let us put that in language that all of us who are not familiar with the vernacular can understand. In other words, if you are going to ship stuff overseas, such as we are doing now to Korea, you have some stuff that is hauled to the port on the west coast in your equipment, and it goes down to the dock. Now, where does the Army's job stop on transporting that stuff at the dock?

Colonel GLORE. When the cargo is stowed aboard to the satisfaction of the commanding officer of the MSTS vessel.

Mr. SCRIVNER. So that it is your responsibility to get whatever equipment it is that you are shipping on board the militry transport in a manner which will suit the judgment of the commanding officer of the vessel?

Colonel GLORE. That is correct, sir.

Mr. SCRIVNER. Then, when that is done, the Army's jurisdiction ceases and that of MSTS begins?

Colonel GLORE. Correct.

Mr. SCRIVNER. Then how far does the MSTS responsibility go?

Colonel GLORE. When he arrives at the port of destination, the far shore, and opens his hatches and lays out his tackle for discharging the cargo, ready to discharge.

Mr. SCRIVNER. In other words, everybody knows we are shipping a lot of stuff to Pusan. Your MSTS will take this ship loaded with your equipment, pull into the port of Pusan, tie up alongside the dock, and then he gets all of his shipping apparatus ready to unload your cargo, and the first winch is turned loose. Then what happens?

Colonel GLORE. The Army moves the cargo.

Mr. SCRIVNER. As soon as the first winch to unload is ready, then the Army again takes over the responsibility of getting off the ship, onto the dock either into warehouse or other transportation, to take the cargo wherever it goes?

Colonel GLORE. That is correct.

Mr. SCRIVNER. That is simple enough. I think we all understand that: but, in this procedure that we have just had described, there has not been any need for any LSU's or any need for any barges. Where do they come in?

Colonel GLORE. Except for this basic point. When you load that vessel in the United States, it is tied up, let us say, at an approved commercial port pier. On the foreign shore it is not always tied up at a commercial pier.

Mr. SCRIVNER. That is what I was just coming to. The operation that you just described is where that is possible?

Colonel GLORE. Yes, where that is possible and there is no equipment required.

Mr. SCRIVNER. Now we go to some other type of operation, where you cannot tie up alongside a dock, either here in the United States or at your port of destination?

Colonel GLORE. That is right, sir.

Mr. SCRIVNER. Then what happens? Suppose there is no commercial facility? What do you have to do?

Colonel GLORE. That ship anchors at the nearest place in quiet water where it can be unloaded. The master makes it ready to unload, and then we come in with these LSU's or other landing craft, alongside the ship in the water, Army-operated, and move the cargo ashore.

Mr. SCRIVNER. In other words, the responsibility again attaches to you?

Colonel GLORE. At the same point of rest.

Mr. SCRIVNER. When you get ready to unload the cargo?

Colonel GLORE. That is right.

Mr. SCRIVNER. And that is the point where you find it necessary to have these various types of landing craft, whether LSU's or anything else?

Colonel GLORE. Yes, sir.

Mr. SCRIVNER. And it becomes your responsibility to handle those craft, and take them in to whatever point along shore you can discharge them and continue your discharge operations?

Colonel GLORE. Exactly.

TRANSPORTATION CORPS SERVICE-TEST ITEMS

Mr. SCRIVNER. You did not mention these service-test items?

General REEDER. Have you a list of the service-test items?

Colonel GLORE. Yes, sir; I have.

Mr. SCRIVNER. Is this it at page 154?

Colonel GLORE. Yes, sir.

Mr. SCRIVNER. What is this high-speed patrol boat? What is that going to replace? We have had patrol boats until they were running out of our ears.

Colonel GLORE. That is an item, I believe, that has been set aside. It is marked out. It has been set aside for reconsideration.

Mr. SCRIVNER. How many other items have been set aside?

Colonel GLORE. Just that one.

Mr. SCRIVNER. What is this item, "Trackless train"?

Colonel GLORE. That is a very sketchy, small-cost exploration into the over-all subject of the trackless train, a good part of which has been assigned to another service.

Mr. SCRIVNER. What other service?

Colonel GLORE. Ordnance. This is a commercial-type trackless train for use over the desert terrain for logistical support. It will carry 30- to 50-ton loads up to 30-percent sand slopes and negotiate loose sandy areas not normally accessible to conventional truck transport. It is planned to get five of those units at a cost of $100,000 before making any permanent commitment to the item or the idea. We can get fairly extensive tests with five units.

Mr. SCRIVNER. That is all.

Mr. SIKES. Thank you, gentlemen.

TUESDAY, MARCH 18, 1952.

INDUSTRY-PREPAREDNESS MEASURES

Mr. SIKES. General Christmas, we are glad to have you back with us to discuss "Industry-preparedness measures." Will you proceed?

General CHRISTMAS. This is category III of industrial development which, under the performance budget, is part of "Procurement and Production." The three other categories, which have to do with plants, tools, and planning in the field, come under "Maintenance and Operations," as I understand. I am not a budget man.

GENERAL STATEMENT ON INDUSTRY-PREPAREDNESS MEASURES

I would like to read a very brief prepared statement. There are four parts or categories in the Department of the Army industrial mobilization program. Three of the categories are carried in the "Maintenance and Operations" appropriation, and the fourth, category III, "Industry-preparedness measures" is included in "Procurement and Production" as budget project 1810.

It is intended through the projects to be accomplished with these funds to shorten the time between the award of contracts with industry or placing orders at Government-owned arsenals and reaching the required wartime production rates, to reduce the requirement for critical materials in the production of munitions, and to develop improved manufacturing processes. As a general rule and as will be noted in the individual projects proposed for fiscal year 1953, the items requiring preparedness measures have little or no commercial counterpart. Practically all of these funds are requested for studies involving ammunition, weapons, vehicles, chemicals, and special electronic components.

Even though the large procurement program during the past 2 years has provided a great amount of industrial preparedness, which in turn has reduced the fiscal-year-1953 fund requirement for this budget project, there are still gaps between mobilization requirements for highly essential combat items and the present production base to be filled by the establishment of pilot-production lines and other industrial-preparedness measures. Approximately $15.5 million of the $19.395 million requested for fiscal year 1953 will be used for the broadening of the production base and reducing the use of very critical materials in the manufacture of such items. Nearly all of the other approximately $4 million requested is to be used for the improvement of manufacturing techniques and the development of technical data

required for the production of munitions. These funds will, therefore, be of much assistance in improving the production capabilities for the items included in the presentations of the technical services.

EXPLANATION OF PROGRAM

Mr. SIKES. What is the total amount of your budget request?

General REEDER. $19,395,000. That compares with sixty-six-million-odd dollars in 1952 and $82 million in 1951.

Mr. SIKES. Quite frankly, I am at a loss to understand just where this fits into the program. It appears to overlap or duplicate some of the research and development program. Will you tell me just where it does fit in and whether there is any duplication or overlapping?

General CHRISTMAS. Let me take an item which is of great interest to you, perhaps. In making small-arms ammunition both for the Army, Air Force, and Navy, because both the Air Force and the Navy get it from us, they are currently satisfied with the ammunition we make and that has been developed. The stage of development is over in the way of research and development, but there is in this request for funds a project for the development of the manufacture of steel cartridge cases which will take the place of the ones made of brass, the reason being that brass is a short item, one element of which, copper, which is a fundamental part of brass, is likely to continue to be short in the United States. So, this is an effort to get ready to make ammunition cartridge cases of steel.

Mr. SIKES. What are you doing in this project that is not being done by Research and Development or some other branch of the service? What is different between your operation and all other operations?

General CHRISTMAS. The Research and Development people would apply this to making use of the new rounds of 20-millimeter, the one that went to pieces when it had explosives in it, and so forth, and they were unable to use the normal thing they had been using, brass, for cartridge cases. And we are currently making right now, with money you have given us for procurement, for the Army, Air Force, and Navy, a new cartridge case for the 50-millimeter machine gun and the 20-millimeter, which is an aircraft gun, steel to take the place of brass. This is a study to get rid of brass by developing manufacturing techniques for using steel, which is not an easy thing to do.

General REEDER. I think the difference might be illustrated by the different types of persons with whom you deal. The people with whom we are dealing here are production men. How do you draw the steel to do this and make a deep enough draw without getting weak walls? In dealing with production-type individuals, this applies.

Mr. SIKES. Do I understand there is no comparable activity on the part of industry?

General REEDER. Of its own volition, you mean?

Mr. SIKES. Yes.

General REEDER. No, sir. We go to them with problems which spring up.

Mr. SIKES. Is this something you would not normally be interested in at all except as complementary or supplementary to your main interest?

General REEDER. That is right. We will reverse the process where industry has developed something new in the way of metal handling or something of that sort.

HISTORY OF THE PROGRAM

Mr. SIKES. When did "Industry-preparedness measures" begin—in what fiscal year? How long have you had a specific appropriation for this item?

General CHRISTMAS. That started about 1947, I would say. It had some symptomatics, but the name "Industry-preparedness measures" is a new one, because back before World War II funds were devoted to this purpose, but they were not so labeled.

Mr. SIKES. What are some of the major developments that have come specifically from this appropriation item in recent years?

General CHRISTMAS. The steel cartridge case for Navy ammunition, for artillery ammunition—a case as high as that and as big around as 90 millimeters [indicating]. That is being produced right now, so that we are not asking NPA for any brass for making artillery shells. That is an accomplishment. The first case had to be developed and then went through this phase, and now procurement money is being used to buy those cases, which will be used and are being used in producing ammunition. They are for Reserve training in shooting ammunition.

PLANS FOR 1953

Mr. SIKES. Do you have a list of the projects planned for fiscal 1953?

General CHRISTMAS. They are in here in some detail. I can give you some of the major items.

Mr. SIKES. Run through some of the major items and tell us how much money is involved. You can submit the detailed information.

General CHRISTMAS. The steel case which I mentioned for the caliber-.50 gun, which is used both on the ground and in the air and by all three Departments, and we are responsible for doing this work under unification for all three services—$2,225,000 for that item.

For the 20-millimeter gun, which is a gun used only by the Air Force fliers and Navy—the Ordnance Department of the Army is the supplier of the item—$2,480,540 for the 20-millimeter, it being a more powerful gun than the 50-millimeter.

Then we have the Army-Navy projectile manufacturing plant. That is a project set up in the Navy-owned plant in the Pittsburgh area, known as the old Hayes plant. It is a cooperative project between the Navy Bureau of Ordnance and the Army Ordnance Corps but monitored by the Navy Department. That is a case again of having a better manufacturing process which will save steel and save manpower, because the present method of making the shell, which is perfectly satisfactory, takes the forging, forges the shell out of a billet and is put in a machine and has a great deal of effort put into it in getting it down to size, and you have a great deal of scrap from the forging. Under this process, they take a disk about that big and that thick [indicating] and put it in a press, and without heating or anything, in a roll state, by the pressing you press a projectile out, and when it is finished it is almost the way you want it. There is very little work to be done on it by any machinist to get it smooth and so forth, and you have then saved both manpower and also saved a great deal of scrap which, under the other process, goes back in the mill and is made into something else.

Mr. SCRIVNER. We have been following this process for some time. This is no new thing.

General CHRISTMAS. This is a continuation. I said the project had already been started at one of the extrusion plants. It is an Army-Navy project at the Hayes plant in the Pittsburgh area, which is the Navy-owned project known as the Hayes plant. It is a continuation of that project initiated last year.

Mr. SIKES. How is the money disbursed? Is this an allocation to industry?

General CHRISTMAS. It varies. You appropriate, of course, to each of the technical services, and they are part of the appropriation bill.

Mr. SIKES. Does the most of it go to industry, or does the service do this work?

General CHRISTMAS. Some goes to industry, and some goes to Government arsenals.

INDUSTRIAL AND GOVERNMENTAL SPHERES FOR DEVELOPMENTAL ACTIVITY

Mr. SIKES. Does industry have no interest in the type of development that is covered in this general budget estimate, or does industry enter in any part into paying for this activity?

General CHRISTMAS. Let me give you an actual example. I met recently with the Industry Integrating Committee on Small Arms Ammunition, and there the question of making steel cartridge cases came up. The volume of small arms ammunition for supporting purposes for these people is small, and they are not willing to put any of their money into this at this time, because they do not see anything coming out of it. At the present stage it looks as if you will pay somewhat more to make your steel case for small arms ammunition than for the brass one. This is a measure to design a method to get out of the need to use a very critical material in wartime when you might expect a higher cost for the cartridge case made of steel initially, because you do not have the copper and the civilian economy must have it also.

General REEDER. I think the name of the items indicates clearly they are those which industry would not have an interest in. They are ammunition items and artillery. In the case of the Quartermaster, there are new dehydrated foods which have only been worked out in the laboratory, and we want to see what can be done with them as a production item. With the Signal Corps, they are primarily a JAN (joint Army, Navy, and Air Force specifications for electronics components) component program, which is generally of a higher quality level than used in commercial manufacture.

Mr. SIKES. Would those processes be of interest to industry?

General REEDER. They sometimes are.

Mr. SIKES. Does industry contribute in any way to this?

General CHRISTMAS. We get their know-how when we work with them.

Mr. SIKES. But we pay the bill?

General CHRISTMAS. In connection with JAN components we do, because we are asking for a radio tube or radar tube that will stand firing on shipboard, stand very hot weather and very cold weather,

stand rough handling, and have a longer life than you would get in the set you buy. In competitive business in selling a domestic radio set, there is no urge to go into that kind of equipment.

Mr. SIKES. Are there any instances in this appropriation request where industry is contributing monetarily to the program?

General CHRISTMAS. I cannot say there is, where they are making a direct contribution to it. Because of the nature of the project, we have to do it; they won't do it. In other words, we are not asking any money for the manufacture of tires or the manufacture of automobiles or the manufacture of gasoline.

Mr. SIKES. Who determines what projects go into this budget?

General CHRISTMAS. They come up from the technical services, and are first screened at the G–4 level because of their relative urgency. They also have a ceiling, so that as to cut off the ones that are of less value. They are then heard by the Munitions Board, which controls the activities for the three Departments, and also to avoid overlap. We do not ask for money that the Air Force has asked for in the same category. Then, of course, it goes to the Secretary, to the Bureau of the Budget, and then to you gentlemen.

STEEL AMMUNITION CASING

Mr. SCRIVNER. Of course, if my recollection is correct, this program of a steel casing is not anything new. We supplied quite a bit of ammunition during World War II with steel casings.

General CHRISTMAS. In World War II, there were some steel casings made very successfully in the case of only one caliber. That is the .45 pistol ammunition. It was also used in what we know as the atomic gun, and there was a limited amount made of rifle caliber.

Mr. SCRIVNER. They went into higher calibers.

General CHRISTMAS. But they have never been accepted.

Mr. SCRIVNER. It was used.

General CHRISTMAS. It was used, but with indifferent success. We do not even know today whether the flying service will accept them.

Mr. SCRIVNER. I can take you to the floor of the House and introduce you to men of my own personal acquaintance who served overseas with different outfits who were in command of units that were using them right in the field, and not one of them has ever had one word of complaint about the steel casings.

General CHRISTMAS. You are talking now about small arms or artillery?

Mr. SCRIVNER. Artillery.

General CHRISTMAS. There were some artillery cases made.

Mr. SCRIVNER. Just a minute ago you said small arms.

General CHRISTMAS. This project is for small arms. We are now manufacturing currently the large cases for artillery, for the 105 howitzer and guns of that type. That is being done.

Mr. SCRIVNER. Perhaps my hearing was a little dull or my recollection is incorrect of the statement you just made a few moments ago. You said then it has been done on small arms. You mentioned particularly small arms.

General CHRISTMAS. I said it was tried in World War II for small arms with indifferent success for ground troops.

Mr. SCRIVNER. It was tried in World War II with the larger calibers with good success as far as I have heard.

General CHRISTMAS. That is not the information I have.

Mr. SCRIVNER. That is just exactly what we are discussing. Those men to whom I referred made no complaint about steel casings.

General CHRISTMAS. They had their troubles with steel cases in that they would not come out of the guns; they would stick in the guns and things of that sort.

Mr. SCRIVNER. Maybe so, but we have had split casings in brass, too.

General CHRISTMAS. Yes, sir.

Mr. SCRIVNER. And sometimes they stick; as a matter of fact, if I recall far enough back, that is one of the major causes of stoppage of machine guns.

General CHRISTMAS. Aging cracks.

Mr. SCRIVNER. They stuck and you pulled the base off and you had a stoppage.

General CHRISTMAS. May I make this clear, that in this request to do this in the field of small arms the Armed Forces are perfectly satisfied to continue to use brass if they can get it, but it looks like we cannot get it.

Mr. SCRIVNER. Not at all times in as great an amount as they want, perhaps, but certainly, if what we have been told is correct, then, of course, all of this program of allocation, all of this program of restriction of the use of critical materials, is to make it possible for the Armed Forces to have what they need; that they would come first.

General CHRISTMAS. This is looking ahead. We are getting right now from NPA brass that we need for our current programs, but this is looking ahead to the time when the demand gets greater; in an all-out war, copper being one of the items that the United States is poor in, we would have to have this as an emergency measure so as not to take all of the copper away from the needs of the civilian economy even in wartime.

General REEDER. If we were this spring to go after the copper for the 105 millimeter, we would really swamp the civilian economy.

(Discussion off the record.)

Mr. SCRIVNER. This is not all Ordnance; is it?

General CHRISTMAS. No; there is the Chemical Corps and the Signal Corps. The Signal Corps is on the JAN components, and the Chemical Corps is for some domestic filtering materials and so forth. Then there is something for classified projects and a small-arms item in connection with dehydrated foods.

TRANSISTOR PREPAREDNESS MEASURES

This Signal Corps JAN component thing will comprise one thing that is a very new development. Included in this will be the work on the new thing called the transistor.

Mr. SCRIVNER. We have been hearing about that for a long time.

General CHRISTMAS. It has been developed so that it works, and now the question is can anybody make it in large quantities.

Mr. SCRIVNER. How do you propose to spend these requested funds to make that determination?

General CHRISTMAS. To finally develop the technique for making those in the quantities, qualities, and sizes we need in the Army, Navy, and Air Force communication equipment.

Mr. SCRIVNER. This is a situation where one would assume that business would be quite interested.

General REEDER. It is.

Mr. SCRIVNER. So that it should probably call for a lesser expenditure. On some of those other things where private industry would never have any particular use for them, strictly military items, I can understand a request for particular sums, but when you come to an item like this where private industry should be most highly interested, it seems as though you might get help from them.

General CHRISTMAS. It was a private development for the long-distance telephone lines.

General REEDER. In the case of transistors, we would not expect to be doing very much, because Western Electric has poured a lot of money into it.

Mr. SCRIVNER. I just followed the statement made by General Christmas and asked him what for, and that is the first thing that popped out; so I assumed naturally that was the most important project he was undertaking with these funds, because I would assume he would tell us the most important thing first.

General CHRISTMAS. I perhaps phrased that wrong. That is a new aspect of this thing, because this matter of developing JAN components has been a continuing project.

Mr. SCRIVNER. Yes; and you have had considerable sums in years past. If time permitted, I would like to have a pretty complete cost accounting just to find out what you have spent the money for and what the results have been from that expenditure, because here is 1951, $15.5 million; 1952, $14.1 million. There is $30 million for this same program, and, if we are getting the results we should expect from this expenditure of money, some of these things ought to be even more curtailed than they have been with those requests of recent years.

Mr. SIKES. I think I shall suggest, Mr. Scrivner, that we request a statement of expenditures showing what part of this money is for new projects, what part is for continuing projects, and that we ask for a further breakdown showing the amount of money that is to be spent by the services and the amount of money to be allocated to industry in this appropriation. I will also request a list of the items for which expenditures are to be made. If those are classified, they can be submitted for the use of the committee but not to go in the record.

Mr. SCRIVNER. May I suggest we have the same thing on what the money has been spent for, so that we see what we are getting.

Mr. SIKES. All right.

Mr. SCRIVNER. This is like research and development, and in many instances it has the appearance of overlapping. And while we have been strong for research and development and seldom reduced those funds, there comes a time when we want to know what the results have been.

(The information requested is as follows:)

New projects	$517,460
Continuation of previous programs, projects, or operations but for different items or production problems	13,322,540
Projects related to previous measures	5,555,000
Total	19,395,000
Amount to industry	16,936,000
Amount to Government arsenals	2,459,000
Total	19,395,000

(Further information was furnished for the committee files.)

INDUSTRY-PREPAREDNESS PROGRAM STAFFING

Mr. SIKES. How many people, military and civilian, are in your shop?

General CHRISTMAS. I have about 50 officers, of which about one-half are Reserve officers on a 2-year tour, and about sixty-odd civilians.

Mr. SIKES. Will that be decreased or increased in 1953 compared to 1952?

General CHRISTMAS. We had a 5-percent reduction in force recently in the Department of Defense.

General REEDER. General Christmas is responsible not merely for this; this is just a little finger of his left hand; he is also in charge of Procurement and Production.

Mr. SIKES. I would like the personnel figures, military and civilian, for 1951, 1952, and 1953 on this particular budget item for the record.

General CHRISTMAS. You mean for this thing we are testifying about this morning?

Mr. SIKES. The $19 million item. Will you supply that?

General CHRISTMAS. You mean at all levels?

Mr. SIKES. All of the people who figure in this $19 million appropriation.

(The information requested is as follows:)

	Fiscal year 1951	Fiscal year 1952	Fiscal year 1953
Military personnel [1]			
Civilian personnel	1,108	1,247	[2] 539

[1] No military personnel paid with funds from "Procurement and production budget activity 1800."
[2] Project order personnel included on page 23 of "Procurement and production" appropriation justifications.

SAMPLE INDUSTRY PREPAREDNESS PROGRAM ITEMS

Mr. SCRIVNER. Where are the Chemical Corps items?

General CHRISTMAS. They are on the first page.

General REEDER. They have a project in gas-mask filter material.

Mr. SCRIVNER. What is your second item—production techniques for newly developed items?

General REEDER. I think one is a flame thrower.

Mr. SCRIVNER. You had those in World War I, and you got some very effective results in World War II.

General REEDER. However, I would want to check that.

Mr. SCRIVNER. Give us a statement on that.

(The information requested is as follows:)

The detailed breakdown of the items to be investigated in the project, "Production techniques for newly designed items," is as follows:

(a) Modification of M9A1 detector kits to simplify construction, reduce costs, increase ease of assembly, improve the pump and pump design, and to simplify the loading of the detector tube	$10,000
(b) The investigation of mechanical method for molding the filter elements of gas masks and collective protectors	60,000
(c) The redesign of eye-piece assemblies of gas masks to improve and simplify the components thereof, and to design improved equipment for assembly to gas masks	25,000
(d) The investigation of the slush-molding technique for the manufacture of M9A1 gas mask face blanks to reduce costs and to improve producibility	25,000
(e) A comprehensive engineering evaluation of the following Chemical Corps items to simplify manufacturing, reduce material and manufacturing costs, reduce or eliminate critical materials, reduce or eliminate waste, substitute commerically available designs, increase the functionability and storageability of the items without affecting the functioning efficiency or ruggedness of the item: M6, collective protector; M9A1, gas mask; M174, fuze; M31, cluster components; M32, cluster components; E74R1, fire bomb: M173, fuze; M157, fuze; E18R1, fuze; E24R1, fuze; M15 and 16, igniters; E48R2, adapter; E53, adapter, grenade components, internal bomb coatings; E19R1, pulse jet smoke generator; E3R2, mixing and transfer unit; E32, lightweight air compressor; M15, WP grenade; E7R1, fire starter; M2A1, incendiary equipment destroyer; E101, cluster components	150,000
Total	270,000

Mr. SCRIVNER. What is this leakage-testing equipment?

General CHRISTMAS. That is a classified project.

(Discussion off the record.)

Mr. SCRIVNER. Improvement in design of operating techniques is another classified project.

(Discussion off the record.)

Mr. SIKES. Thank you, General Christmas.

General CHRISTMAS. Thank you, sir.

QUARTERMASTER CORPS PROCUREMENT AND PRODUCTION

GENERAL STATEMENT ON QUARTERMASTER PROCUREMENT

Mr. SIKES. General Marshall, the committee will be glad to hear you on the requirements of the Quartermaster Corps for Production and Procurement.

General MARSHALL. Mr. Chairman, in presenting this portion of program 1500 in the appropriation, "Procurement and Production, Army," I would like to emphasize the fact that the Quartermaster Corps is charged with the responsibility of providing materials-handling equipment for all technical services of the Army as well as for service-type troop units in the Field Forces. The actual purchase of this equipment is the responsibility of the Department of the Navy, in accordance with an assignment by the Munitions Board.

Materials-handling equipment consists of fork-lift trucks, straddle trucks for movement of lumber, ammunition-handling trucks, roller conveyors, and many other items used in the handling of the various

types of supplies and equipment stored and issued throughout the Army.

During the 5-year period following World War II, comparatively little new procurement was authorized and it was necessary to extend the useful life by a continuous major rebuild program of those items purchased during World War II. This program is no longer economical, and during the past 2 years we have been replacing overage and worn-out equipment.

For fiscal year 1953 we are requesting $30,818,000, as compared to $49,452,000 in 1952. This decrease is primarily due to a reduction in the amount requested for mobilization reserves and in initial issue. In addition to this, there is included in our request approximately $5,000,000 to replace items required for the support of combat in Korea during fiscal year 1952.

This estimate has been prepared to cover only the minimum essential requirements which will provide a continuation of the replacement program and complete the allowances to field units.

QUARTERMASTER MOBILIZATION RESERVE

Mr. SIKES. How much of this request is for Army reserve?

General MARSHALL. For mobilization reserves, $8,925,000.

(Discussion off the record.)

Mr. SIKES. If you eliminate the part of this budget which would go into mobilization reserve, what percentage of your reserve requirements for first year of war would you have?

General DECKER. Actually, some of this is against what we might call dead horses. They are asking $30 million. Only $13 million will go into war reserve. The rest is to replace items being consumed in Korea.

Mr. SIKES. Has there been any build-up of war reserve in these items prior to this budget request?

(Discussion off the record.)

COMMERCIAL AND NONCOMMERCIAL QUARTERMASTER ITEMS

Mr. SIKES. Of these items, which ones are special-order items rather than commercial-use items?

General MARSHALL. In general terms, electric spark-proof trucks for handling ammunition would come under that category; and lumber straddle trucks, while they are used commercially, are not what you would call a normal item of manufacture.

Mr. SIKES. Can everything else be considered commercial items?

General MARSHALL. They have commercial features, but there are certain specifications which they would have to add to meet military requirements in the field.

Mr. SIKES. Is there any real requirement for stockpiling or placing in mobilization reserve the types of items you are seeking in this budget request?

General REEDER. Yes, sir. One of the first things that happened when Korea broke out was a requisition for a large amount of this roller conveyor.

General MARSHALL. The basic reason is that the people who manufacture this type of item are not large manufacturers. Their capacity

is not large and they do not keep their money invested in inventories of finished items.

Mr. SIKES. Are any of these long-lead-time items?

General MARSHALL. They are mostly of 9 months lead time.

Mr. SIKES. Is this equipment in the main intended for use in the zone of the interior, or is it intended also for overseas use?

General MARSHALL. The majority of it would be in the zone of the interior, because of the preponderance of the depots in this country. However, it is used for depots overseas, plus service units' equipment. For example, in Korea a large amount of this equipment is used at the port of Pusan.

RELATION OF STORAGE SPACE TO PROCUREMENT

Mr. SIKES. Is any effort made to relate your purchases to storage facilities so that you have a place to keep and take care of this merchandise after you get it?

General MARSHALL. You mean stocks that the equipment handles, or stocks of the equipment?

Mr. SIKES. Of this equipment itself.

General MARSHALL. Our stockage of it is not too large.

Mr. SIKES. Do you have storage facilities for these items, or are they stored out in the open?

General MARSHALL. These are all under closed storage. I have been in a number of depots where they have been in closed storage, and I have seen items they have had stored outside, but they were generally put there before they were repaired.

COMBAT SUPPORT REPLACEMENT ITEMS

Mr. SIKES. What items specifically are to be acquired with the $5 million which will replace items required for support of combat in Korea during fiscal 1952?

General MARSHALL. I could give some examples. The 10,000-pound crane—29 of them are for replacement of combat.

Of the warehouse gasoline tractors, 4,000 pounds, 56 are for replacement of combat; of the 7,500 gasoline warehouse tractors, 64.

Of the fork-lift truck, 2,000 pounds, there are 8; in the gasoline fork-lift truck, 4,000 pounds, there are 202; in the gasoline fork-lift truck, 3,500 pounds, there are 173; in the gasoline fork-lift truck, 6,000 pounds, there are 197; in the gasoline fork-lift truck, 10,000 pounds, there are 40; in the same type of fork-lift truck, 15,000 pounds, there are 32.

In the gravity conveyor, 10-foot length, there are 336 that are 12 inches wide. Gravity conveyor, 10-foot length, 18 inches wide, 670. That is the one used mostly in unloading operations at the port. In the gravity conveyor, 10 feet long, 16 inches wide, there are 161 of those.

REFRIGERATORS

Mr. SIKES. Tell me something about the portable refrigerators we are buying at a cost of $2,314 each. I see you are buying 1,200 of them. Where would you use them?

Colonel SHAUG. Here is a picture of the type of equipment in that particular item.

Mr. SIKES. What is the size? I note you have down here "150 cubic foot," but what are the dimensions of it?

Colonel SHAUG. About 8 feet high.

General MARSHALL. They used to be 8 by 10.

Mr. SIKES. Of what is it made?

Colonel RITCHINGS. That is a wooden exterior with insulation. I think they are replacing it with metal and regular insulating material, and it has a wooden panel interior.

Mr. SIKES. How is it powered?

Colonel RITCHINGS. By an electric generator, which is bought separately.

Mr. SIKES. What is the capacity in pounds of commonly stored items?

Colonel RITCHINGS. I will have to provide that for the record.

(The information requested is a follows:)

PORTABLE REFRIGERATOR, 150 CUBIC FEET

Use.—Issued to small isolated units to store frozen and perishable meats, vegetables, eggs, etc. It is self-contained and can be transported on a 2½-ton truck and operate while in transit.

Dimensions.—Inside: 66 by 70 by 60 inches; outside: 80-inch length by 77½ inches high by 76 inches wide.

Basis of computation.—Refrigeration requirements of all types of equipment are based on an average of 3 cubic feet of refrigerated space per man per month under normal redistribution conditions as experienced under combat conditions of zone of communication. On this basis a 150-cubic-foot refrigerator would serve 50 men.

Capacity.—A 150-cubic-foot refrigerator will store: Boneless meat, 6,000 pounds maximum; or lettuce, 600 dozen heads of lettuce; or eggs, 100 cases (360 eggs to a case).

Mr. SIKES. Where are they going to be used?

Colonel SHAUG. They are used for storage by small isolated units in the field and also for shipping food by trucks. They can even use them for storage of food on ships if necessary. They are usually conveyed in the 2½-ton truck.

Mr. SIKES. Under "Miscellaneous" you have three items amounting to $285,000. That is high-priced miscellaneous. What is it?

General MARSHALL. One item is a 600-cubic-foot warehouse refrigerator, prefabricated, without the power unit. The second item is an 1,800-cubic-foot refrigerated warehouse refrigerator, prefabricated. The third portion of that is for refrigerating units for these same types of refrigerators.

Mr. SCRIVNER. What do you mean by "refrigerated"? You mean refrigerating power units?

General MARSHALL. Small refrigerating units. The first breakdown of 600 cubic feet amounts to $129,000.

Mr. SCRIVNER. Not for each one?

General MARSHALL. No. That is the total. They cost $5,163 each.

Mr. SCRIVNER. That is how many?

General MARSHALL. That is for 25. The second, 1,800-cubic-foot refrigerators, covers 25 units at $4,100 apiece, or $102,500. The third item representing the value of component units, which have various prices, is $53,900.

Mr. SCRIVNER. Where are these to be used primarily?

Colonel SHAUG. They are used primarily in warehouses.

Mr. SCRIVNER. You use them instead of using refrigerated warehouses?

Colonel SHAUG. Yes, sir. They could be used in the field where they establish warehouses and there is need for refrigeration at that point and no commercial facilities are available. These would be brought in and used for that purpose.

Mr. SCRIVNER. Is the same thing true of the 1,800-foot?

Colonel SHAUG. Yes, sir; both of them are the same.

Mr. SCRIVNER. You refer to them as being "prefabricated." How difficult are they to erect? What is the material?

Colonel RITCHINGS. It is a metal exterior with insulation and a wooden interior, and they come in sections and are not very difficult to erect. They have all of the parts, and all you have to do is to assemble and install the generating unit.

Mr. SCRIVNER. How sturdy are they? I suppose, for instance, if you are using them in the zone of the interior, you might need something like this in some of your maneuver areas. You set them up, and then what happens if you want to tear them down and move them? Are they sturdy enough to be torn down and set up again?

Colonel RITCHINGS. Yes, sir; they are very sturdy.

Mr. SCRIVNER. You can do that without too much wear and tear on them?

General MARSHALL. I have done that myself. I have seen them torn down and moved and set up again.

Mr. SCRIVNER. How do you justify your need? On what do you base your requirement for 25 of each of these?

Colonel SHAUG. The 25 is based on an experience factor which takes into consideration past issues for a certain number either of installations or use of the item in the field and then forecasting it to the future based on what we anticipate the organizational structure will be or what operations are contemplated in the future. This is primarily what we term a class IV item. By that I mean we have no definite table which will show us so many of those go for so many units, but we have to estimate what the activity for the future will be and base on that an estimate to determine what the requirement will be.

Mr. SCRIVNER. How many of them do you have on hand. What was your inventory at the start of the year or at any given time?

Colonel SHAUG. The inventory as of June 30, 1951, for the 600-cubic-foot prefabricated warehouse was zero.

Mr. SCRIVNER. Did you get any funds in 1951 for them?

Colonel SHAUG. We have procurement due-ins as of that particular date.

Mr. SCRIVNER. Did you get any funds in the 1951 appropriation or in the supplemental for this?

Colonel SHAUG. Yes, sir. We received funds to procure 159.

Mr. SCRIVNER. What did you get in 1952?

Colonel SHAUG. That was 1952. In 1951 it was 100.

Mr. SCRIVNER. In 1952——

Colonel SHAUG. In 1952 it was 159.

Mr. SCRIVNER. Now you are asking for 25 more?

Colonel SHAUG. Yes, sir.

Mr. SCRIVNER. What was your use experience last year?

Colonel SHAUG. For class IV requirements we had a usage factor of 150.

(At this point a number of questions and answers were eliminated from the record at the suggestion of Mr. Scrivner.)

Mr. SCRIVNER. Now let us start all over again and go clear back to the first question I asked about the usage, because I have been given so many conflicting statements that it is necessary to go back to my original question and strike out all that has taken place since then.

Let us start all over again on the 600-foot warehouse refrigerator.

General MARSHALL. In order to compute the requirements up to date, we have computed that our class IV requirements for the period June 30, 1951, to the end of 1953 are 284 refrigerators. Of this, the regular class IV requirement amounts to 150.

(Off the record.)

Mr. SCRIVNER. Now, does that add up?

General MARSHALL. As of June 30, 1951, we had no depot stocks. We had on procurement 100 refrigerators. During the fiscal year 1952 we ordered 159 refrigerators, making a total of 259 purchased. In this year's budget we are including 25 refrigerators.

(Discussion off the record.)

Mr. SCRIVNER. The information I was trying to get a while ago was this. What is your usage? What has been done with these refrigerators? We were told that these figures were set up on usage rates. You say that you had none on hand June 30, 1951.

General MARSHALL. During this same period—this represents June 30, 1951, up until today—we have issued for Korea 150 of these refrigerators out of this total of 259.

Mr. SCRIVNER. Have they actually gone to Korea?

Colonel SHAUG. Yes, sir.

Mr. SCRIVNER. All 150?

Colonel SHAUG. Yes, sir.

Mr. SCRIVNER. I assume that the 109 remaining out of the 259 are on order?

General MARSHALL. Yes, sir; on order or have been delivered.

Mr. SCRIVNER. Have any of them been delivered?

General MARSHALL. We have not the field reports on that, sir.

Mr. SCRIVNER. What are you going to do with that?

(Off the record.)

Mr. SCRIVNER. And so we have the 25?

General MARSHALL. Right, sir.

Mr. SCRIVNER. Upon what sort of calculation do you make the determination that the 134, which would include the present 25, are essential?

Colonel SHAUG. Taking the mobilization plan for the first year of war and taking into consideration the augmentation of the forces, and either the offensive or defensive activity which is to take place during that period of time—based on that information, we arrive at the figure of 134.

Mr. SCRIVNER. Is the same true of your 1,800-foot refrigerator?

General MARSHALL. Yes, sir.

(Off the record.)

Mr. SCRIVNER. Have those been procured and shipped to Korea?

General MARSHALL. The 100 have; yes, sir. One hundred fifty have been purchased out of the total requirement of 175. Therefore there are 25 in this budget.

(Discussion off the record.)

Mr. SCRIVNER. The same is true on the 600-foot item. Now what about your refrigerator units? Is the same story true there? I suppose there are 50 of those at varying prices.

Colonel SHAUG. We do not have a breakdown of the total number of units. However, that is based on issue experience for the fiscal year 1951 and the fiscal year 1952 and on a straight dollar basis the figure of 53,898 was arrived at.

Mr. SCRIVNER. Do you issue these warehouse refrigerators without refrigerator units?

Colonel SHAUG. These are to replace units for these other refrigerators that are actually in use, rather than to budget for a whole new refrigerator unit.

Mr. SCRIVNER. In other words, some of these are for these refrigerator units and some are for replacements?

Colonel SHAUG. Yes, sir.

Mr. SCRIVNER. For some other type of refrigerators that you have?

Colonel SHAUG. Yes, sir.

Mr. SCRIVNER. This did not involve a lot of money, but it was rather difficult to get the facts. Let us go back to the portable 150-foot refrigerator and give us the detailed information upon which you based your requirement of 10,986, and tell us on what you based your request for 1,200 at a cost of $2,777,000?

Colonel SHAUG. We shall supply that answer.

(The information requested was furnished for the committee files.)

Mr. SCRIVNER. That is all.

QUARTERMASTER CONCURRENT SPARES

Mr. SIKES. Explain your program for concurrent spares.

General MARSHALL. Those are spare parts bought at the time the end item is bought, and are of two types. One is the proprietary item, so to speak; in other words, the item which fits that particular end item. Then you have the common items which are bought with the unit. The common items amount to 6 months of maintenance and the proprietary items are for the life of the unit.

Mr. SIKES. Have the number of spares that are bought been revised up or down in this budget compared to previous purchases?

General MARSHALL. This is our first procurement of concurrent spares, sir.

Mr. SIKES. I thought it was generally the practice to buy spare parts with the equipment. You have not done so heretofore?

Colonel RITCHINGS. No, sir.

Mr. SIKES. How have you acquired spare parts before—as the need for them developed?

Colonel RITCHINGS. Yes, sir.

Mr. SIKES. Has that practice resulted in any serious delays or crippling of the equipment?

Colonel RITCHINGS. The reason we are including concurrent spare parts is because of field needs.

General MARSHALL. There have been some delays in the last few years, sir.

General REEDER. Practically speaking, you had such a bunch of cats and dogs amongst your equipment that you had to have spares for them.

General MARSHALL. Most of our equipment was bought during the war and we had to take any kind that was available. As a result, as General Reeder says, we had a heterogenous collection of spare parts for the various types of equipment. We are trying to stabilize that program. We are buying concurrent spares with the equipment, and are projecting the life of the equipment beyond that which we were able to do with some of the old-type equipment.

Mr. SIKES. Is the equipment you are buying at this time standardized equipment which can be readily repaired or replaced with other similar equipment?

General MARSHALL. It is standardized, sir, so far as the manufacturer's specifications will allow. In other words, the Navy buys this on bid. There is no single type of item that all manufacturers would make.

Mr. SIKES. Then you do not provide your own specifications except in rare instances. You take what the manufacturer produces for commercial use?

General MARSHALL. In general terms; yes, sir. We do have certain specifications for that which is to be added to the machine. The performance is mainly on specification.

Mr. SIKES. Is there considerable interest on the part of the manufacturers in bidding?

Colonel RITCHINGS. I could not provide the number for the record, sir, at this time.

General MARSHALL. Has there been considerable bidding to your knowledge?

Colonel RITCHINGS. We have received more than two and three bids on these items; yes, sir.

General MARSHALL. There is a limited number of manufacurers of this particular type of equipment, Mr. Chairman.

Mr. SIKES. General Marshall and gentlemen, thank you very much.

CHEMICAL CORPS PROCUREMENT AND PRODUCTION

Mr. SIKES. We shall take up project 1100 and project 1140, as well as project 1400, with witnesses from the Chemical Corps.

Major Martin, will you tell us what you are requesting?

SMOKE GENERATOR COMPANIES AND EQUIPMENT

Major MARTIN. Mr. Chairman, we have at the present time 25 smoke generator companies in being. We have four companies in Korea. These companies have been in operation since the beginning of the Korean campaign. They are now in positions at various river crossings prepared to provide the smoke type of protection.

We have in the past procured the M2–2 generator. We have a new type generator which we call a "pulse jet," this generator has the advantage of greater durability in the field, and ease of operation. We are asking for funds for this type of generator.

That is what we are asking for new [indicating photograph], compared with the old M2. You can see the maintenace problems that we had with the M2. It was delicate and required much training and there was too high a replacement factor on spare parts. Also there

was the fact that the operator had to be a real expert to keep the generator going and in condition. They did, but it was always a problem. The new generator, the pulse jet, is on an entirely different principle. It is a very simplified generator. It is very sturdy and from the standpoint of ease of operation, we find in Korea where this generator has been field tested, that we can use about twice as many generators per company.

We have not changed the table of organization for that, but where we do plan to use it is on special class IV operations where indigenous personnel can be used, to reduce the number of trained Army personnel necessary.

Mr. SIKES. Can you tell us the comparative costs of the two?

Major MARTIN. The old generator was $991. The new one is $1,100. I would like to point out that that represents the cost under the first contract. We have every indication that on renegotiation the new generator will be probably $200 cheaper than the old generator.

Mr. SIKES. Will you tell me just how practical you have found the use of smoke? It seems to me the users are largely at the mercy of the wind in trying to lay down smoke to cover a specific area. How much of the time can you get practical results from the use of smoke?

Major MARTIN. The maximum time, sir, in a static situation, such as a harbor—the way the generators are utilized, the companies go into position and set up the generators on three sides of the harbor or on two sides. And they are mobile. If they have sufficient generators they go into what they call a static position and ring the harbor, depending on the way the wind is blowing. If they do not have sufficient generators, they remain mobile and go into positions where the offshore wind would carry the smoke across the harbor.

Mr. SIKES. Let us take a river crossing where you are unable to ring the position, where you are limited to one side of the river and the enemy is on the other shore. There you are tied to the wind.

Major MARTIN. Yes, sir. If there is a wind against us, there is no practical use for the generator, sir. If it is a light wind, we have found in river crossings that you generally have varying conditions, your smoke, being a solid particle actually, will settle into the flat areas and generally, if we smoke at night, the next morning we can still have a haze. We can establish a haze condition which will cling to the ground, which provides an obscuring effect and, to a high-speed bomber or strafing aircraft, it very definitely cuts down the time that they have to use against those targets.

Mr. SIKES. Have you found the use of smoke may be a detriment rather than a help under field conditions?

Major MARTIN. I do not know of any case, sir, where it has been so proven.

(Discussion off the record.)

Mr. SIKES. Tell us about your other item, project 1140, "Portable flame throwers."

Major MARTIN. That is a service-test item, sir.

CHEMICAL CORPS AMMUNITION

Mr. SIKES. What other item do you have?

General REEDER. They have some ammunition in project 1400.

Mr. SIKES. Are you going to justify that item, Major?

Major MARTIN. Yes, sir.

Mr. SIKES. Proceed to tell us about it. How much of it is mobilization reserve?

Major MARTIN. Two hundred and thirty of these will go into the reserve, sir.

Mr. SIKES. What are they?

Major MARTIN. The set, accessories, gas identification, detonation, sir, is a training-type item. This is a photograph of the item.

It is the accessory kit that goes with the set, gas identification, detonation. The detonation set consists of tubes of actual gases that are placed out in the field when they are training troops and detonated by means of an electrical detonator. The troops stand downwind and they go through this small cloud of toxic agent to learn how to identify and to sense what the gas is.

The set accessory goes with the next item, which is the detonation set itself. The set accessory augments the identification detonation set. The identification detonation set itself contains the toxic gases and this item is to provide the mechanics of detonating those gases.

LAND MINES

Mr. SIKES. You have a request item for $110,000. What is that?

Major MARTIN. That is the land mine. It is a simple 1-gallon can.

Mr. SIKES. What is its purpose?

Major MARTIN. It is used for large-area contamination. We use it in training for acquainting troops with large-area contaminating operations. An instance of that would be if you wanted to deny the use of a road to the enemy. You fill your land mine with one of the toxic gases. You can string them out in back of a slow-moving vehicle down each side of the road. It gives the ground troops a means of rapid contamination of an area at the end of a bridge, or a road or a road junction, something of that nature.

CHEMICAL CORPS SERVICE-TEST ITEMS

Mr. SIKES. Tell us something about the service-test items.

Major MARTIN. I think this should be off the record.

(Off the record.)

Mr. SIKES. How many of these items are new items that have not previously been tested?

Major MARTIN. They have been tested, sir, up to the user test which is what we are actually procuring them for here.

Mr. SIKES. Are they now ready for service-testing?

Major MARTIN. Yes.

Mr. SIKES. They have not previously been service-tested?

Major MARTIN. No, sir.

Mr. SIKES. Are they new from the standpoint of actual use?

Major MARTIN. Turning them over to the artillery or the Air Force or whoever is going to be the eventual user, who send them to their board for testing and their board recommends adoption or not.

Mr. SIKES. Are any of them long-lead-time items?

Major MARTIN. Not from the Chemical Corps standpoint. We might have a problem on procurement of shell, for instance; this is an

item of Ordnance procurement. I could not comment on that with accuracy. We try to foresee that and work with Ordnance, for instance, and as soon as these begin to firm up to where we can see a real major procurement effort coming up, we consult with Ordnance at that time.

BACKGROUND OF THE CHEMICAL CORPS WITNESS

Mr. SIKES. Would you please state your own background? From what institution were you graduated?

Major MARTIN. Atlanta School of Law, sir.

Mr. SIKES. What is a lawyer doing in Chemical Warfare?

Major MARTIN. I was fortunate. I was not a lawyer at the time I entered the corps, but the army has been good enough to give me the opportunity to attend night school to complete my education.

Mr. SIKES. Have you had any training in chemistry, special training in chemistry?

Major MARTIN. No, sir.

Mr. SIKES. Are you a reservist or a Regular?

Major MARTIN. I was integrated in 1946 into the Regular Army.

COMMENDATION OF MAJOR MARTIN

Mr. SIKES. I think you show a remarkable grasp of the subject matter that you are discussing. I want to commend you, General Decker, for bringing someone up here who can talk about his subject. Some of the people you have had up here in the last few days did not know their lessons too well, and I think they should be warned to prepare themselves, in order to be able to present their subject as it should be.

General DECKER. I agree with you thoroughly, Mr. Chairman.

Major MARTIN. Thank you very much, Mr. Sikes.

Mr. SCRIVNER. I have no further questions, Mr. Chairman.

Mr. SIKES. Thank you, Major Martin.

Major MARTIN. Thank you very much, sir.

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